THE COAST ARTILLERY JOURNAL

Published as the Journal U. S. Artillery from 1892 to 1922

MAJOR ROBERT ARTHUR, C. A. C. . . . . *Editor and Manager*
FIRST LIEUT. JAMES L. WHELCHEL, C. A. C. . . . . *Assistant Editor*

Volume 68 | May, 1928 | Number 5

CONTENTS

Authors alone are responsible for statements in contributed articles

Published monthly under the supervision of the Commandant, Coast Artillery School, by direction of the Chief of Coast Artillery, for the information of the Coast Artillery personnel of the Regular Army, National Guard, and Organized Reserves.

Terms: United States, $3.00 a year; single copies, 50 cents. Canada, $3.25 a year; single copies, 55 cents. Foreign, $3.50 a year; single copies, 60 cents.

Entered as second class matter at the Post Office at Fortress Monroe, Va. Acceptance for mailing at special rate of postage provided for in Section 1103, Act of October 3, 1917, authorized May 8, 1920.

Address: The COAST ARTILLERY JOURNAL, Fort Monroe, Va.

Printed by HOUSTON PRINTING AND PUBLISHING HOUSE, *Hampton, Va.*

Report Documentation Page

Form Approved
OMB No. 0704-0188

1. REPORT DATE	2. REPORT TYPE	3. DATES COVERED
MAY 1928		**00-00-1928 to 00-00-1928**

4. TITLE AND SUBTITLE	5a. CONTRACT NUMBER
The Coast Artillery Journal. Volume 68, Number 5, May 1928	5b. GRANT NUMBER
	5c. PROGRAM ELEMENT NUMBER
6. AUTHOR(S)	5d. PROJECT NUMBER
	5e. TASK NUMBER
	5f. WORK UNIT NUMBER
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) **Coast Artillery Training Center,Coast Artillery Journal,Fort Monroe,VA,23651**	8. PERFORMING ORGANIZATION REPORT NUMBER
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)	10. SPONSOR/MONITOR'S ACRONYM(S)
	11. SPONSOR/MONITOR'S REPORT NUMBER(S)

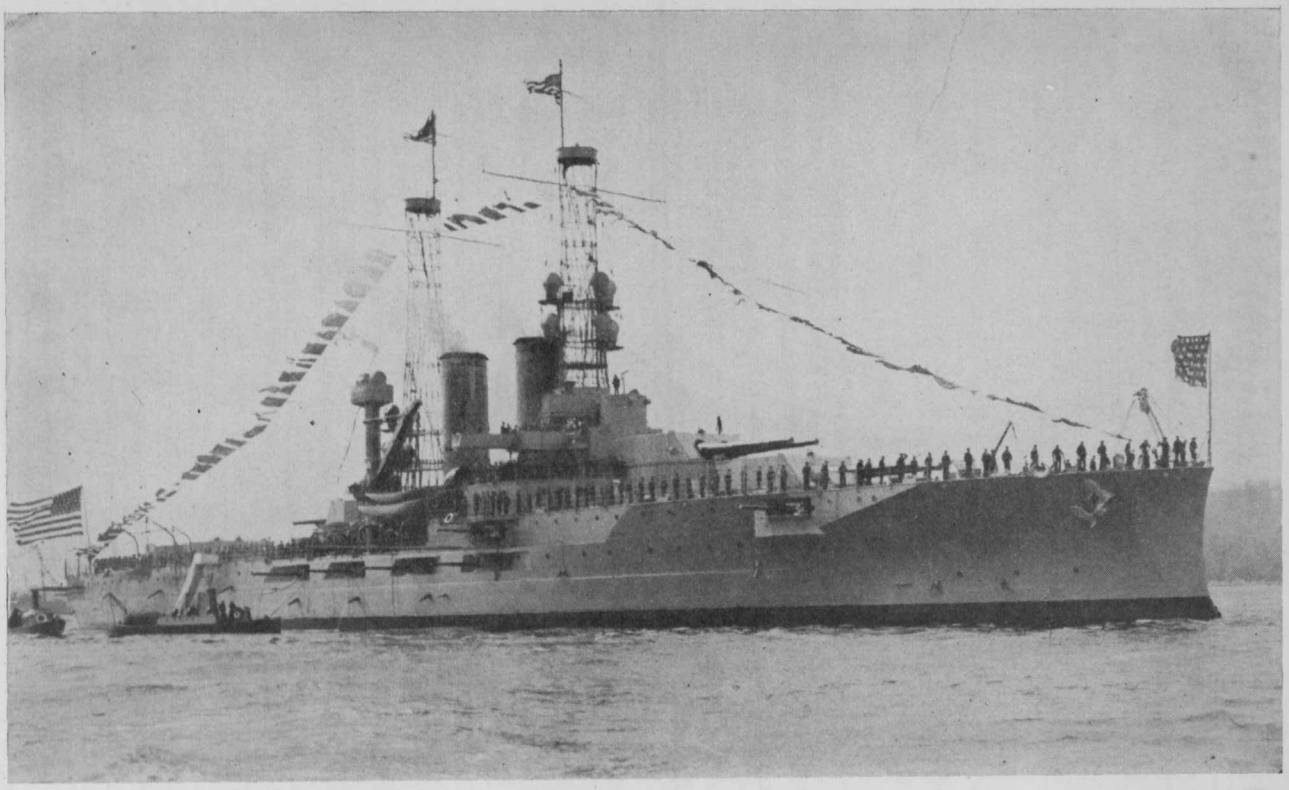
12. DISTRIBUTION/AVAILABILITY STATEMENT
Approved for public release; distribution unlimited

13. SUPPLEMENTARY NOTES

14. ABSTRACT

15. SUBJECT TERMS

16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES	19a. NAME OF RESPONSIBLE PERSON
a. REPORT	b. ABSTRACT	c. THIS PAGE			
unclassified	**unclassified**	**unclassified**	**Same as Report (SAR)**	**100**	



U. S. S. UTAH

Length overall, 521 feet 6 inches. Beam, 88 feet 2 inches. Draft, mean, 28 feet 6 inches. Displacement, normal, 21,825 tons. Guns: ten 12-inch, twelve 5-inch, eight 3-inch, four 3-pounders, 4 machine, 2 landing. Armor: belt, 11 inches, turret, 12 inches-8 inches, deck, 3 inches. Designed horsepower, 28,000. Designed speed, 20.75 knots.

THE COAST ARTILLERY JOURNAL

Volume 68 May, 1928 Number 5

The R. O. T. C.

By COLONEL JOHN T. GEARY, C. A. C.

STUDENTS of American history are well aware that from the time of the Revolution to the World War nothing had ever been done to establish for our Country anything even approximating a military policy. After each war we sat back in the old rocking chair of ease and delusion and tossed off a resolution that there would never be another war. We always paid for our delusion in blood and treasure when the conflict came upon us. The narrow escape of the Allies from utter defeat in the spring of 1918 shocked this nation as it had never been shocked and alarmed before. With all our material wealth and man power it was only by the narrowest of margins that we were able to put into the fighting lines a sufficient force in time to insure victory for the Allies.

After our Armies returned from Europe the question of a suitable military policy became of paramount importance. Out of the conflict of opinions and opposing views there was finally created our present National Defense Act. This act emphasized the maintenance of organized reserves. It was realized that with the passing of the years, the war officers, with combat experience would have to be gradually replaced on account of the disabilities incident to age and a new reservoir or source of supply developed. The R. O. T. C. and C. M. T. C. were accordingly called into being to develop the military leadership for our citizen armies.

With a potential man power of fifteen millions capable of bearing arms, the necessity for a large number of trained officers to develop and lead these millions was fully realized and our Defense Act wisely authorized the President to establish in our schools and colleges a Reserve Officers' Training Corps to be instructed by officers detailed from the Army. The question is sometimes asked: why impose this military system on our schools and colleges? Why create a military atmosphere that will cause young Americans to look at international questions from the viewpoint of an armed man in uniform rather than from the viewpoint of pure and unadulterated peace?

Our Constitution provides for the National Defense. If our educational system means anything it surely means that our favored young collegians of today will in a large measure become the leaders of the future. This very equipment for leadership entails extra responsibility and in the event of a national crisis they should be leaders and not followers. There is absolutely nothing in our system of military instruction that glorifies war or thwarts in anyway the sane efforts that are being made to prevent its reappearance. College men, generally, live in a world of actuality and realize that a nation's capacity for defense and its influence in the maintenance of world peace must be based on something more substantial than pious aspirations.

Our National Legislators, many of whom saw service with the Colors, were quick to estimate the value of the R. O. T. C. units in our schools and colleges. They accordingly made provision for their installation and enacted that the military instruction offered by the government should be voluntary or compulsory, so far as the students are concerned, as the governing powers of the colleges may elect.

The R. O. T. C. plant has reached a healthy growth and is found in every state in the union. Reports from the Adjutant General's office show that for the school year 1926-1927 there were established in 223 educational institutions 322 military units having a total enrollment of 108,957. Of these units, 225 were senior units having a basic enrollment of 57,880. The entire situation may be best presented to the eye by the following classification:

	Number	*Units*	*Enrollment*
1. Colleges and universities essentially military	8	18	5,331
2. Essentially military schools	38	40	7,993
3. Colleges and universities not essentially military	117	204	64,527
4. High schools	53	53	28,469
5. All others	7	7	1,637

It is pertinent to observe that these 322 military units are scattered throughout our forty-eight states.

While the military instruction offered is in accordance with War Department schedules, the efficiency of the units is by no means uniform. The conditions under which they operate and the facilities for outdoor instruction vary widely. Some make the military instruction compulsory. Some have voluntary military instruction and still others make the basic course compulsory and the advance work voluntary. Under the first classification of the above tabluation we find eight institutions having an enrollment of 5331. This class may be typified by such well known schools as Norwich University and the Virginia Military Institute. The essentially military schools number thirty-eight and carry an enrollment of 7993. These schools are for the younger

boys and they do not grant degrees. The average age of the students on graduation is less than twenty-one. The schools and colleges grouped under these two classifications live in a military atmosphere. Most of them wear a distinctive uniform. They are under military control throughout the twenty-four hours of the day. They are proud of their organization and maintain a high *esprit de corps.*

In the third class are found most of our foremost institutions of learning in the country. From the purely military viewpoint it would be an ideal situation if this large third class lived in the atmosphere of the essentially military colleges. However, this is not attainable and the vital thing to do is to put forth our best efforts in developing this excellent personnel under the conditions imposed. It contains the very cream of our young American manhood. Here are found the best educated young men in the country. It is *par excellence* the primary source for officers to develop our citizen army in the event of necessity. If for lack of time or training facilities they do stand out in the showy externals of discipline it must be remembered that they have disciplined minds and having undergone substantial instruction in their chosen arm of the service these men can rapidly acquire the discipline and service viewpoint after mobilization occurs. As stated above, this class numbers 117 colleges, with an enrollment of 64,527, embracing all arms of the service. The technical schools nearly all have one or more units from the technical arms. Many of the larger institutions of this class, particularly those located in the larger cities, have limited facilities for outdoor instruction. They could hardly be expected to measure up to the standards of soldierly appearance and smart execution of parade ground drills observed in the first two classes. Despite these differences the fact remains that these military units are distinct military assets. They are receiving systematized instruction with modern military equipment and all are of value in our citizen army. The Engineer and Ordnance students are seriously studying the technical matters pertaining to these arms. The Artillery students are mastering the technicalities of gunnery and familiarizing themselves with the guns they use. The Infantryman, comprising 70% of the entire number, is preparing himself to meet the exacting requirements of the modern doughboy. This is the most economical, the most efficient, and the most thoroughly American system yet devised in time of peace to qualify a selected number of patriotic young Americans for military leadership. Those of us who are on duty at these civil institutions and

know the reactions of these young men to certain phases of the camp instruction realize that there is room for much improvement in the matter of suitable modern materiel if interest is to be maintained in the camps.

At the end of the school year 1926-1927 five thousand and eighteen who graduated from these schools took the oath and qualified as Reserve Officers, United States Army. To those who only see harm in military instruction in our colleges, I offer the following from the catalogue of one of New England's best universities: "Respect for law, obedience to authority, self control, power to command, are the results of this military training. Each peaceful art seeks men with these qualities, and, finding, rewards as war never has and never can."

MAXIM XXXVI

When the enemy's army is covered by a river, upon which he holds several tetes de pont, *do not attack in front. This would divide your force and expose you to be turned. Approach the river in echelon of columns, in such a manner that the leading column shall be the only one the enemy can attack, without offering you his flank. In the meantime, let your light troops occupy the bank, and when you have decided on the point of passage, rush upon it and fling across your bridge. Observe that the point of passage should be always at a distance from the leading echelon, in order to deceive the enemy.—Napoleon's* Maxims of War.

Some Aspects of Mechanization

Command

By COLONEL H. ROWAN-ROBINSON, C. M. G., D. S. O., *p. s. c.*

Reprinted by Permission from *The Army, Navy and Air Force Gazette*

THOSE who followed in the Press the doings of the Experimental Mechanized Brigade may remember that *The Times* correspondent reported the difficulties of direction and umpiring to be almost insurmountable. Captain Liddell Hart, writing on the same subject in the *R. U. S. I. Journal*, says "Control is the real problem . . . of a mechanized force, because of its very fluidity, the distance it covers and the speed which marks both its movements and its engagements." That the same problem has been exercising the minds of the authorities concerned was evidenced in the speech made by the C. I. G. S. at the conclusion of the maneuvers, in which he remarked that* "the problem of command and control was still unsolved, but it was† *at least* clear that, as with cavalry, the commander must be very far forward, and that it would probably be essential to supplement his wireless orders by the personal direction of staff officers who knew his mind." From the above it is clear that the question of controlling a mechanized force is one of the principal, if not *the* principal problem that has to be faced in connection with mechanization; for the best machines and organizations in the world are of but little worth unless adequately commanded.

The advice of the C. I. G. S. will no doubt ameliorate matters under the conditions for which it was given, namely, a mechanized force acting against an unmechanized force. But, though we may hope in the initial stages of a campaign to be more highly mechanized than our opponents, the period of this superiority is unlikely, in an industrial age, to be of long duration unless a decisive victory brings the war to a rapid conclusion.

We have therefore to prepare ourselves also for a battle between two highly mobile forces when the difficulties of control as compared with those experienced on Salisbury Plain this year will be greatly multiplied. The General Staff is said to aim at a rate of movement of 100 miles a day; the pace of the faster vehicles will certainly reach 50 m. p. h. and the basic speed of columns perhaps 10 m. p. h. Esti-

* *Daily Telegraph*, Sept. 10, 1927.
† The italics are the writer's.

mation of probable direction of enemy attack is rendered difficult, not only by this increased speed, but also by the power of cross country movement possessed by tracked vehicles. With rates of approach varying from 20 to 100 m. p. h. and with directions of approach more than ever doubtful, how is a commander to form a plan of battle?

In the first place, if he is a good commander, he will, to some extent at least, have already formed his plan and will endeavor to force his opponent to conform thereto. Granting that, let us picture his position and action as the hour of battle approaches.

He is in a mobile headquarters office probably some 10 miles ahead of his heavy tanks and covered, apart from reconnoitering bodies, by a screen of tankettes. It is a summer morning about 7 o'clock. The country is mildly undulating with occasional small woods. Shortly before dusk on the previous evening his airplanes had spotted large enemy forces 50 miles away and had picked them up again at 6 A. M. moving towards him. His armored cars were in touch with enemy light vehicles last night and are falling back slowly before them now. By 8 A. M. the light troops on both sides are fighting in open formation spread over a wide extent of country seeking for an opening *"On cherche partout et on voit."* A few dragon-guns are in action about the center of the field but without satisfactory targets. Above, the opposing airplane groups, each seeking to attack hostile heavy formations in rear, are themselves engaged in battle, with reconnoitering machines watching both flanks. The main bodies, consisting largely of heavy tanks, are now 10 miles apart and closing on each other at the rate of 20 m. p. h. In half an hour a collision may be anticipated. Again, what is the commander's plan, what are his possible modes of action?

The following courses are open to him:

a. He may remain in his office where he has every convenience for the receipt of information and the issue of orders and either (1) order up his heavy tanks to join him, or (2) having studied the ground and settled on his probable maneuvers, join his heavy tanks and lead them into action, or

b. He may take up his position on high ground and endeavor, either in or out of his tank, to direct the battle from that vantage point; or

c. He may direct the action from a rear headquarters.

Under *a,* after ordering his light vehicles to clear to one or both flanks, he leads his main body to the attack. At 8:45 A. M. he receives his last report, the enemy main body being then 5 miles away, and travelling directly towards him. At that moment enemy tankettes retiring before him throw out a thick smoke-screen. He then takes a

closer order and proceeds slowly—perhaps by compass. His tankettes in the meantime endeavor to pierce the smoke-screen on both flanks and gain contact. At 9 A. M. large forces are reported moving against his right flank. He swings round; but will he be in time?

Or, under *a*, he might alternatively have acted as did the enemy. But in that case would he have found and struck his objective?

There is no answer to either of these queries. The whole matter, like the field of battle, is wrapped in fog. No real plan can be executed. The combatants reach blindly at each other. The issues of the combat depend solely on chance. Are we to stake the national fortunes on such a risky encounter?

Under *b*, having chosen his vantage point, the commander finds the enemy has changed direction to such an extent as to render observation and command from that point out of the question. Such an eventuality is so likely that this method may be ruled straight out without mentioning other obvious drawbacks inherent in it.

As regards the last method mentioned—control from a rear headquarters—however rapid means of communication become, however well-trained the signal personnel, and however capable the staff, it is hardly conceivable that, between the receipt of information of a nature sufficiently definite to justify the formation of a final plan and the occurrence of the first great clash, there will often be time to frame and issue the orders necessary to give effect to the plan. It is even less likely that a commander will be able to follow the fortunes of his forces in the succeeding phases of the battle and direct their purpose.

There appears, therefore, to be no method of ground control that can be satisfactorily applied to the motorized force. It may perhaps be objected that, as in the Navy for the rapid movements of a fleet action control is exercised efficiently from sea level, it should be equally possible to control a highly mobile army from ground level. Such an argument, however, carries but little weight. In the first place, the controversy that has for a decade raged round Jutland indicates the question of command in a fleet action to be by no means finally settled. Is it not possible that with the improvement in flying boats, the admiral of the future will seek a wider view and a more direct contact with his whole fleet? In the second place, at sea visibility is greater, communications are simpler and maneuvers less restricted than on land.

As, then, ground control is impossible, it remains to consider the feasibility of air control. This is a method which has long been advocated by the writer. It suffers from the following serious drawbacks:

(1) Personal danger to the commander and consequent liklihood of having to find and send into the air one or more new commanders in the course of the battle.

This is a very real objection, especially in view of the recent improvement in antiaircraft work; and the replacement of the commander in such a rapidly moving battle will be no easy matter. It might be possible to keep a second-in-command or a senior staff officer in the air to take his place, but this is an extravagant method, and a better solution might be to allow (successively, if necessary) one of the other officers who would normally be in the air at the time to take command—the C. R. A., the officer conducting reconnaissance, or the senior formation-leader in the R. A. F.

(2) A special aeroplane will be needed, so built that—

(*a*) The pilot can act as gunner as well as driver.

(*b*) The commander has facilities for really good observation, quick communication with pilot, writing, study of maps, and speaking on wireless telephone.

(*c*) It can carry a signaller and his equipment. (Only required if it be found that the commander cannot issue orders on the phone in addition to carrying out his other duties.)

As pilots act as gunners in single-seaters, and machines are built equal to the transport of 25 men, no impediment should arise with regard to *a* and *c;* but there is said to be a real difficulty in building a machine in such a form that anyone but the pilot can obtain the good observation essential to the execution of air control. In a service, however, that represents the solution of the major problem of "flight," is it likely that the lesser problem of "observation" will remain long unsolved?

(3) The need of a special escort.

One fighting plane will certainly be required for the protection of the commander; and possibly a whole flight—attached to the H. Q. of the force—for his protection and that of the other military officers in the air; for these people would be performing duties from the execution of which they should, if possible, not be distracted by the attack of enemy planes.

(4) Observation and direction may be impossible owing to the prevalence of low clouds and mist.

This is not as serious a drawback as might appear at first sight; for it is one that handicaps both sides equally. A motor battle in a mist would be a pell-mell affair that no commander would willingly undertake unless he knew that his opponent was riding unprotected at anchor in a tank-harbor or committing some equally heinous tactical

crime. It is much more probable that each commander would endeavor to profit by the mist either to effect repairs, of which there will be a continual need, or to gain a strategic advantage either by breaking contact or by placing himself, unobserved from the air, on his enemy's flank or line of communication.

These are the obstacles to air control. They are by no means insurmountable; and in the opinion of the writer they are outweighed by the prospective advantages of such a system, which may now be stated.

In the first place, the commander obtains a clear view of all the preliminaries to the battle and can either impose his plan on his opponent or adjust it to meet the needs of the situation. Secondly, he can command during the various stages of the battle, however fast they may move, handling his heavy tanks, his light tanks, his field guns and taking advantage of any mistakes committeed by the enemy, in a way quite impossible on the ground. Thirdly, he is in close touch with his air commander. And, lastly, he is in a position to conduct the pursuit.

On the ground he is blind; in the air he can see. This is also true in operations of today; but the difference between the two forms of warfare, that renders air control essential with the army of the future, is the speed factor. The slow development of battles in France enabled command to be exercised, not only from the ground, but actually from positions far in rear of the fighting troops. But, even there, on occasion, such as the Canadian victory short of Passchendaele and in the battle of August 8, the presence of a commander or a responsible staff officer in the air might have changed relatively barren victories into decisive successes. In the battle of the future no other method of command will be possible, so the sooner officers are trained to it the better. It is a matter that cannot be postponed for 15 years, when mechanization, if peace condition continue, may be completed; for, long before the end of that period, there will be sufficient mechanized vehicles available for the formation of strong, independent, armored forces, which must be commanded from the air. Moreover, should any great war take place in the *interim*, whether we are engaged in it or not, the rate of mechanization of all armies will be greatly enhanced.

According to Press notices, one officer actually did command an armored force from the air for a single operation during the summer training. It was not stated, however whether he was successful or not; but this is not a matter of importance. In India, a few years ago, the C. R. A.'s of opposing forces were sent up to control their guns from the air. One reported strongly against the method; the other was doubtful as to its value. Neither, however, had any previous air exper-

ience, and neither had thought the matter out beforehand; nor is the need imperative for such a form of control in a mildly mobile warfare. Before a method with such obvious difficulties and such decided advantages can be shelved, it must be thoroughly tried out; and the most careful investigation must be made of its merits and demerits, the type of planes to be used and the code of signals to be employed. It is not a question of sending up an officer to see what he thinks of it, but of years of endeavor to find the right system by a process of continual trial and error.

MAXIM XLV

A fortified place can only protect the garrison and detain the enemy for a certain time. When this time has elapsed, and the defenses of the place are destroyed, the garrison should lay down its arms. All civilized nations are agreed on this point, and there never has been an argument except with reference to the greater or less degree of defence which a governor is bound to make before he capitulates. At the same time, there are generals —Villars among the number—who are of opinion that a governor should never surrender, but that in the last extremity he should blow up the fortifications, and take advantage of the night to cut his way through the besieging army. Where he is unable to blow up the fortifications, he may always retire, they say, with his garrison, and save the men.

Officers who have adopted this line of conduct have often brought off three-fourths of their garrison.—Napoleon's Maxims of War.

Danger Zones—The Balkans

F. F.

EDITOR'S NOTE: *Do not read this article unless you have a Balkan map handy. By special arrangement between the editors and the author, this article appears in the current numbers of the* COAST ARTILLERY *and* INFANTRY JOURNALS.

OF WARS and rumors of wars there is no end in the Balkans. Four-fifths of the European wars during the past century have originated in territory now included in Greece, Albania, Jugoslavia, Rumania and Bulgaria. Since 1910 no other region in the world has surpassed the Balkans as a breeding ground of troubles that have engulfed millions in lands both near and far. If it were possible to localize their conflicts, the Balkan states might fight at will; but once started, the conflagration becomes a raging forest fire that defies control. The Balkans form today, as they have in the past, a danger zone that seriously menaces the peace of the world.

Macedonia is the main center of Balkan woes. That unhappy land has been a maelstrom into which wars have thrown fragments of all the Balkan peoples. There they have churned about and ground together until now they are hopelessly intermingled. Mutually hostile Turks, Albanians, Slavs and Greeks, embittered by violent conflicts of religious and racial traditions, have been stewing together in this Balkan cauldron for centuries, but as yet the melting pot has produced only confusion and discord. For over 2000 years many races have fought against each other and against new invaders. Conquering races have in turn been conquered and trampled into the dust by the victors. In recent centuries, Macedonia has furnished many of the battlefields on which Christians have fought the Turks. Turkish misrule and tyranny, continued over hundreds of years, have implanted greed, deceit, fear, distrust, and violence as common characteristics of the people. The only effective law in Macedonia is the law of force.

The bulk of the Macedonians are more closely akin to the Bulgars than to any other race. Some of them want autonomy for Macedonia; others demand union with Bulgaria. Their revolutionary efforts to achieve this union, first directed against Turkey, and more recently against Greece and Jugoslavia, have been actively carried on for the past twenty-five years—apparently with the full knowledge and at least tacit consent of Bulgaria. The revolutionist irregulars *(comitadjis)* openly maintain their headquarters at Sofia, the Bulgarian capital. Under Turkish rule, this movement included many truly patriotic men and had the support of the Macedonian peasants. Most of the patriots have been killed or persuaded to change their ways but the *comitadjis*

who have had to change their tactics, to professional cutthroats, are stronger than ever. In the year 1924, they were responsible for some 20 assassinations, mostly political; their depredations in the countryside have antagonized the peasants. The peasants are tired of being "liberated"; they want peace and a chance to harvest decent crops. As a result of the changed peasant attitude, the *comitadjis* have had to change their tactics. Instead of conducting raids with large armed bands, they now send out agents singly, or in twos or threes, from Bulgaria, to execute the desired assassinations in Greece and Jugoslavia. The Bulgarian government claims to be powerless to stop these outrages, but as they serve to keep alive the Macedonian issue, its sincerity is open to doubt. The unchecked acts of terrorism committeed by Bulgar-Macedonian *comitadjis* are an active threat to Balkan peace.

Why does this wretched province continue to mould national policies? The recent history of Macedonia is a series of struggles wherein Turkey has sought to retain possession, while Serbia (later Jugoslavia), Bulgaria, and Greece have each tried to seize parts of the disputed ground. Even far-off Rumania has taken an active interest in every effort of her neighbors to divide Macedonia, and the Great Powers of Western Europe have more than once interfered. Macedonia is important because it controls the main north and south line of communications that serves the whole Balkan peninsula. On the west, mountainous country separates the interior from the Adriatics; the one natural outlet—Drin Gap—has never been opened up to trade, and Italy now has it securely plugged with Albania. This situation is not likely to change, for Mussolini has Albania under his thumb. The Macedonian route from Belgrade via Nish and Uskub to Salonica has easy grades, few natural obstacles, and a standard gauge railway line. It points the natural direction of Jugoslav hopes for a port on the Aegean. The future of Bulgaria is also bound upon expansion to the south. Thus the ambitions of Jugoslavia and Bulgaria overlap and conflict with those of Greece. Turkey now has no part of the province, Bulgaria has a mere foothold, Jugoslavia has a large slice, and Greece has what the others want—the Aegean seaports. Encumbered though it is with political toll-gates, Macedonia is a first class international highway.

At present that highway carries but little of the traffic it could bear. The Greeks are interested primarily in trade and shipping; they have neither fertile lands nor a large class of farmers. The Slavs, on the contrary, are true sons of the soil; their interests are almost entirely in farming, but they know the futility of raising products that are cut off from world markets. Jugoslavia is blocked at Trieste, Fiume, Zará and the Albania ports on the Adriatic; Bulgaria has access to the Mediter-

ranean only by the roundabout Black Sea-Bosphorus-Dardanelles route. Treaty stipulations bind Greece to provide Jugoslavia with adequate port facilities at Salonica, and to grant Bulgaria certain rail and water concessions at a port to be selected on the north Aegean coast, but as yet Greece has not seen fit to carry out her obligations. This short-sighted Greek policy is retarding the development of her neighbors and is steadily increasing their dissatisfaction with present arrangements. Cooperation would bring ample prosperity to both seafaring Greeks and agricultural Slavs, but greed and distrust keep them apart.

Though Greece now has the upper hand in Macedonia, she has troubles of her own. Her recent political history is a record of much change with little progress. Popular votes evicted the king and approved the establishment of a republic—then military dictators took control for a while; and now parliamentary rule is precariously established. The Greek adventure into Asia Minor resulted in a series of costly disasters. Greek refugees from Asia Minor, destitute, homeless, and without means of earning a livelihood, poured into Greece in 1922 and 1923 in such numbers as to increase the population by 30 per cent in two years. To duplicate the Greek refugee problem in the United States, imagine an influx of 36,000,000 impoverished immigrants. Even this great country would be hard put to absorb such a mass; poorly equipped Greece has found it almost impossible to provide for the 1,500,000 that have surged into her congested ports. Faced with the necessity of finding homes and work for these people, Greece will be loathe to give up any of her lands in Thrace or Macedonia that are suitable for settlement. She is, in fact, reclaiming 160,000 acres of land in the Salonica district to ease the pressure at that port. This project, when completed, will make Salonica the most important city in Greece. There is little chance that the Greeks will voluntarily grant substantial concessions in Salonica to any foreign power.

To secure facilities denied at Salonica, Jugoslavia is seeking an outlet on the Adriatic. Almost exclusively an agricultural country, Jugoslavia during the past several years has greatly increased her exportable surplus of grain, beet sugar, and tobacco. Her mineral resources of coal, copper, iron, lead, and gold, though still undeveloped, are of considerable importance. Her output of timber increased nearly 300 per cent in the 1921-24 period, and has continued to grow steadily. On the Adriatic, the possible commercial outlets are Susak (next door to Fiume), Spalato, and Cattaro. Susak now has fairly good rail connections with the hinterland, but lacks suitable terminal yards, warehouses, and wharves. Despite these handicaps, Susak now handles much of the tonnage formerly routed through Fiume, and with national

support might easily become an important Jugoslav port. It lies, however, too close to Italian territory for safety, and at best could not serve central and southern Jugoslavia to advantage. To develop either Spalato or Cattaro will require the expenditure of about $50,000,000.00. After careful study, engineers have found both projects to be equally practicable. Spalato is especially favored because it would help the economic development of rich provinces that are now isolated; furthermore, it would quiet Croat and Sloven protests against the Cattaro projects, whose benefits would accrue almost entirely to the Serbs. Jugoslavia is now negotiating for a $250,000,000.00 foreign loan to be used for economic development, and may soon start to make Spalato her principal seaport.

Before Jugoslavia directs her economic development towards the Adriatic, she must consider stategic as well as commercial possibilities. In peace time, Spalato would give Jugoslavia free communication with the world; but the Italian protectorate over Albania has given Italy the power to bottle up the Adriatic. Mussolini's aggressive foreign policy directly concerns Jugoslavia, for all signs point to Italian ambitions for expansion eastward. The treaty of Tirana (November, 1926) between Italy and Albania caused a furor in Jugoslavia, and the more binding Italian-Albanian agreement of November, 1927, increased the tension. The Jugoslavs have no exalted opinion of Italian warriors. Fascist or otherwise, and are confident that they can defend their country in a war with Italy alone. They admit, however, that the real defense would be in the mountains; Italy could easily take the Dalmatian coast, and with it all the Adriatic ports. Commercially the Spalato project is sound and desirable; strategically, it is weak. The creation of Albania as an independent nation in 1913 threw Serbia back upon the Adriatic, and Italian pressure may now force Jugoslavia back towards her natural outlet—Salonica. Like many other Balkan problems, assurance of opportunity for Jugoslav economic development hinges on control of Macedonia.

Bulgaria too is vitally concerned with the status of Macedonia. Ever since 1878, when Bulgaria won freedom from the Turks, she has sought to free her people in Macedonia and Thrace from foreign domination. Up to 1913 her efforts were successful; the Turks suffered defeat and Bulgaria secured Eastern Rumelia (Southern Bulgaria), a large part of Macedonia, and some of Thrace. Then came two catastrophes—the Second Balkan War (1913) and the World War—that wiped out many of Bulgaria's previous gains. Now she is cut off from the Aegean, and many of her people are ruled by Jugoslavia and Greece. Bitter resentment for the harsh treatment these people

receive adds to the intense feeling that accompanies Bulgaria's uphill struggle for renewed economic stability. The *comitadji* activities previously mentioned indicate the dangers inherent in the racial issue; economic issues are equally dangerous.

Bulgaria is making serious efforts to revive her trade and industry. Thirty years of rapid progress in education and the field of economics had raised Bulgaria in 1911 to an important place in the Balkans, but the following decade brought only confusion and stagnation. Bulgaria emerged from the World War with her economic structure in ruins, enormous internal debts, a staggering reparations bill, and the loss of territories that are essential to her economic development. She has not recovered any of these territories, but has bettered her condition in many other ways. About 90 per cent of the people are farmers who have small farms of their own. They have modernized their methods through large imports of German agricultural machinery, and are rapidly bringing the land back to full productivity. Tobacco, which finds a ready market in Germany and Italy, has displaced grain over considerable acreage, though wheat remains an important crop. Flour milling, sugar refining, and woolen textiles are industrially important; four large copper mines are being worked profitably; and the coal mines, yielding about four times the 1911 tonnage, are producing an exportable surplus. Financially, the country has made great progress. In 1923 the reparations bill, which was manifestly beyond Bulgaria's ability to pay, was cut to one-fifth of the previous figure. In 1925, while the French and Italian currencies continued to fluctuate wildly, Bulgarian national currency was stabilized. Great sacrifices and hard work have enabled Bulgaria to survive her severest economic crisis; she now faces a prosperous future in which her most serious handicaps are lack of capital and inadequate communications.

As Bulgaria's prosperity increases, her need for better communications will increase. Therein lies grave danger, for the conflict with Greek interests will become ever more serious. The north Aegean ports at Dedeagach, Kara Agach, and Kavala are now undeveloped and commercially unimportant, but any one of them could be made suitable for Bulgarian use. Kara Agach, though situated in an unhealthy marshland district and not connected with existing railway lines, has the only sheltered harbor on the whole north coast. Bulgaria had selected it, before the World War, for development as a trading port, and now wants to carry out the project. The Treaty of Neuilly (November, 1919) states: "The Principal Allied and Associated Powers undertake to insure the economic outlets of Bulgaria to the Aegean Sea. The conditions of this guaranty will be fixed at a later date." The

Thracian Treaty of August, 1920, gave similar but more specific promises. After waiting for eight years, Bulgaria still has no port on the Aegean; she is becoming impatient for the fulfillment of the treaty promises. Should Greece become involved in domestic difficulties, or with a foreign power, Bulgaria would undoubtedly seize the opportunity to make good her demands.

None of the Balkan states thus far considered has material advantages that equal those of present day Rumania. That country gained as a result of the World War all the territories that both sides had offered to win her as an ally—the Dobruja from Bulgaria, Transylvania and the Banat from Austria-Hungary, and Bessarabia from Russia. She has a wealth of fertile soil, access to large navigable rivers that flow into the Black Sea, great resources in minerals and oil, and an industrious population which now numbers about 17,000,000. Her oil production in 1925, 25 per cent more than in the previous year, was greater than ever before; and 1926 established a new high record output. Rumania apparently has all the requisites for great economic prosperity.

Her political horoscope is not so favorable. The government for many years has been controlled by the Bratiano group, and has been administered largely for their benefit. Jon Bratiano, recently deceased, succeeded his father as prime minister of Rumania in 1909; during the next eighteen years he held the premiership eleven times, and maintained his control even when not in office. Upon his death the former finance minister, Vintila Bratiano, became prime minister and continued his brother's well established practice of exploiting the country. Opposition that the more experienced statesman was able to check is now proving troublesome. The peasants are demanding some share in the government, and new general elections free from the coercive measures of the old regime. The presence of recently absorbed groups of Magyars, Slavs, and Bulgars, that welcome a chance to berate the government, will stiffen the opposition. Thus far there have been no important disturbances, but the tide of discontent is rising.

A domestic upheaval in Rumania would have far reaching results. Russia has protested against Rumania's seizure of Bessarabia, and does not consider that Rumania has a valid title to that province. The Soviet leaders have established the Moldavian Socialist Soviet Republic adjacent to Bessarabia, and are energetically propagating Bolshevism among the poorly governed Bessarabian peasants. Hungary has envious eyes upon the Banat and part of Transylvania; Bulgaria is eager to regain the Dobruja. If swollen Rumania bursts asunder, there will be an international scramble for the pieces.

Although the Balkans have cooled somewhat from the white heat of wartime passions, they are still molten. The scraps of paper that hold the Balkan states apart may go up in flames momentarily. Diverse selfish interests, guided more by prejudice than reason, have replaced the one influence—hatred of the Turks—that has ever been strong enough, even temporarily, to unite these turbulent states. Extreme nationalism, harsh treatment of submerged races, territorial disputes, and the conflict of economic needs are all potent factors in the Balkan situation of today. Even domestic issues are confused and unsettled. Cooperation in social and economic matters that concern two or more states is well nigh impossible. Each state distrusts the others, and is itself insecure.

Fear of Italy is one thing that the Balkan states have in common. All of them distrust Mussolini, and are prone to see his hand in every event that affects their interests. Italy's thrust into Albania has thoroughly alarmed the Balkans and has revived the rivalries of the great European powers. Before the World War, the Balkan states were pawns that the Great Powers moved at will; Austria-Hungary, Germany, Turkey, Great Britain, Russia, and France each had special interests to protect—interests which often brought discomfiture to the pawns. Since the war, until recently, there has been a tendency to let the new Balkan states shift for themselves. Austria-Hungary is dismembered and helpless, and neither Germany nor Turkey can interfere. Great Britain's greatest interest is to preserve the present state of peace in Europe; she would take an active part in Balkan matters with extreme reluctance. Russia has had her hands full at home. However, her traditional role as guardian of the Slav peoples, the zeal of Soviet leaders to spread Bolshevism, and their detestation of Fascism will undoubtedly bring Russia into any Balkan conflict that involves Italy. France is interested in maintaining the alliances between Jugoslavia, Czechoslovakia, and Rumania (The Little Entente); furthermore, she has recently concluded with Jugoslavia a treaty which counterbalances the Italian-Albanian treaties. Mussolini's speech and actions give the Balkan states ample reason to fear Italian aggression, but they have this assurance—Russia and France will inevitably oppose Italy.

Scores of Yesterday

By CAPTAIN HOMER CASE, C. A. C.

THE late Eighties found the seacoast artillery emerging from the doldrums which were a heritage of the Civil War. The massive stone forts still bristled with smooth bores. Even as late as 1893 the only guns in service were two 20-inch, three hundred eight 15-inch, and nine hundred ninety-eight 10-inch Rodman smooth-bore guns, ten 8-inch converted rifles and one hundred 200 and 300-pound Parrotts. The 8-inch converted rifles had been constructed by enlarging the bore of the 10-inch Rodmans and inserting rifled lining tubes of cast steel. But better days were coming. Already private plants were manufacturing forty-four cast-iron, steel-hooped 12-inch mortars; and Congress had appropriated the money to build the Seacoast Cannon Shop at Watervliet Arsenal. And the large-caliber, breech-loading, built-up cannon of Model 1888 would soon be in the defenses. In 1894 Lieutenant G. N. Whistler wrote, "Within a comparatively short time samples of the new ordnance will be mounted upon our fortifications; and it is to be hoped that by the end of the century we will find at least our most important works fully equipped with the modern armament."

A new and ambitious group of young officers was turning its thoughts to the problem of the proper use of the new guns they were soon to handle. A list of the subscribers to the JOURNAL OF THE UNITED STATES ARTILLERY for 1892 contains the names of Captain Ingalls, Lieutenants Bliss, Ruckman, Menoher, Lassiter, Snow, Weaver, Hinds, Barrette, Squier, March, Ruggles, Todd, Cronkhite, and Whistler. These officers filled the pages of the JOURNAL during its first few years with their ideas and opinions on "ballistic firing," "target firing," and "tactical firing." Whistler's Graphic Tables, Ingall's Tables, and Ruckman's Tables of Wind and Atmosphere Data were referred to and worked with.

It was under these conditions that the first instruction order for seacoast artillery target practice was issued in General Orders No. 41, War Department, 1896; and in this order the first score for target practice was set forth. Practices were fired at floating targets anchored in the water. The hypothetical target upon which hits were scored was more like the present small-arms target than any target used since. The target (Fig. 1) represented the battleship of that day, the three horizontal belts representing the deck, the freeboard, and the vulnerable underwater section. Shots striking the freeboard were given values.

from 1 to 10, while deck and underwater hits counted 75% and 50%, respectively, of the values for the freeboard hits. The score for the practice was the sum of the values of the shots fired. For the larger guns three shots constituted the practice, with a larger number for the smaller guns. The position of the splashes with respect to the anchored target was computed from readings taken by axial and flank observers, who telegraphed their observations in to the battery. Hits on the hypothetical target were computed from the deviations of the splashes and the angle of fall. Time for each shot was taken from the command to load until the shot was fired. In case of a tie in score, the battery with the shorter time was declared the winner.

0.8	1.5	3	4.5	6	7.5	6	4.5	3	1.5	DECK.
1	2	4	6	8	10	8	6	4	2	FREEBORD.
0.5	1	2	3	4	5	4	3	2	1	UNDERWATER

FIG. 1

This target and score were used for five years, and it was not until 1901 that firing at towed targets was made mandatory in the service. During these five years the Spanish-American War had been fought, with all its disruption of garrison life. However, the installation of new batteries had been continued and in 1901 they were found at almost every post. No satisfactory position-finding systems had been devised, and it was the golden day of gadgets and devices. Major Whistler and Captain Hearn were still perfecting the plotting board which was to be the standard for twenty years, and the other equipment was still in the making. A Chief of Artillery had just been authorized by Congress and the minds of the Corps were on the problems presented by the fine new materiel.

In this year (1901) the number of shots for a practice had been raised to ten, and the time allowance was liberal. Shots were fired at a towed target, but hits were computed on a hypothetical target representing a battleship 360 feet long. In this year transmission of data over telephones was first mentioned, although the telegraph was still used. A score of 1.00 was given for each hit with a shot fired within a certain time limit, with smaller values for longer times. The following table gives the scores allowed for different guns, with time allowances. In addition, five minutes was allowed between the first and second shots and between the second and third.

Type of gun	*Score for each hit, with time to fire each shot*			
	1.00	0.75	0.50	0.25
12" B. L. Rifle; 8" M. L. Rifle	4 min. and less	4.5 min.	5-6 min.	6-7 min.
8" and 10" B. L. Rifles	2 min. and less	2-3 min.	3-4 min.	4-5 min.
12" B. L. Mortar	5 min. and less	5-6 min.	6-7 min.	7-8 min.

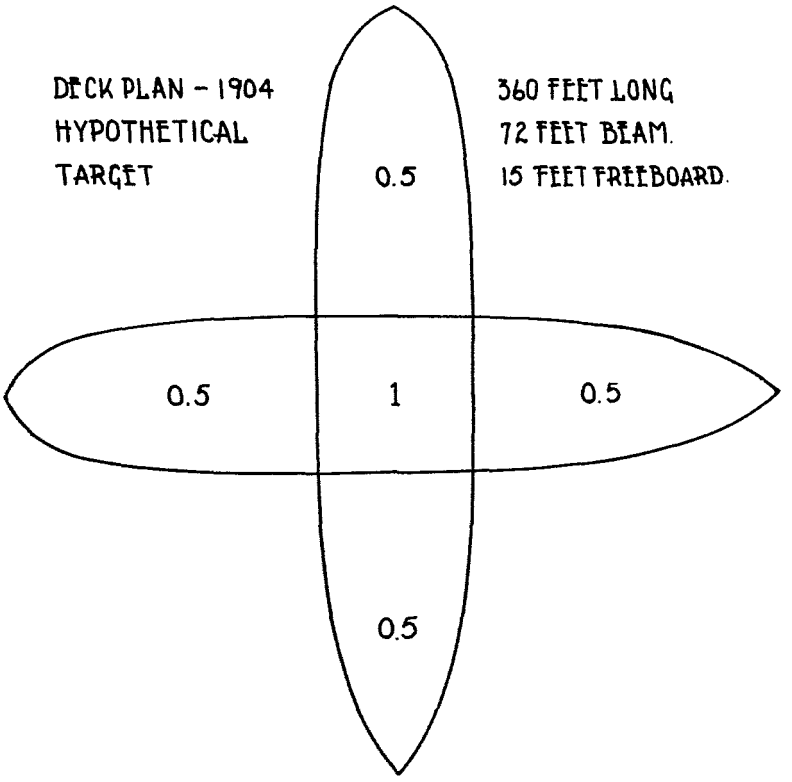


FIG. 2

In 1902 three practices of five shots each were allowed, and this system continued through 1903 and 1904. Each year the time allowance was reduced until in 1904 five shots must be fired in eight minutes for the maximum score. In 1904 the hypothetical target for guns was very peculiar. It was the battleship of that time, but it was considered that the ship was placed upon the materiel target both broadside and end-on (see Fig. 2). Shots which hit the broadside target only or the end-on

target only received one half point, while a shot which hit both received a full point. Evidently this was not very successful for in the next year the conventional broadside battleship reappears. However, the danger space was computed to include the ricochet, which was assumed to rise from the water at an angle equal to twice the angle of fall. One trial shot was allowed each quarter for guns and three for mortars. Short range for target practice was given as below 4500 yards, mid range up to 7500 yards, and long range above that.

The instruction order for 1905 brought the first score in the equation form it was to keep for so many years:

$$M = \frac{T_a - T_e}{T_a} \times H^*$$

In addition, there were penalties for keeping disappearing carriages tripped for more than 20 seconds without firing.

In other years there was a score at one time and a figure of merit at another, but in 1906 both were used. The hypothetical target remained the same, and for the first time three trial shots were allowed for guns. The figure of merit was used to compare batteries of the same caliber, but the purpose of the score was not given.

$$\text{Score} = \frac{T_a}{T_a + T_e} \times H \qquad M = \frac{T_a + T_e}{T_a} \times D.$$

The figure of merit is hard to understand, for the greater the time consumed in excess of the allowance the greater the value. The time allowance for each shot with the 12-inch disappearing carriage was two minutes, for the 10-inch, one and one-half minutes, and for the 12-inch mortars, two minutes.

In 1907 and 1908 was used for the first time a score which made any allowance for the fact that the probability of hitting for guns became smaller as the range increased. The values of P for varying ranges

---

* The following listed symbols are used in this article, even though they may not have been used at the time published. In general, they follow Coast Artillery Memorandum No. 7, W. D., 1926.

M—Figure of merit, figure of efficiency, or score.
Ta—Time allowance of series in minutes.
Te—Time of series in excess of allowance.
H—Number of hits, usually on hypothetical target.
HGM—Hits per gun per minute.
D—Mean absolute deviation of record shots.
E—Mean absolute error of record shots.
P—Probability of hitting. Until 1927 taken from tables and the same for all guns of 6-inch caliber and above.
K—An arbitrary constant. Intended to equalize the score of batteries of different calibers and carriages.
S—Number or record shots fired.
g—Number of guns fired.
B—Mean angle of track of target with line of fire.
L—Length of hypothetical target for guns in direction of fire.

were published in the instruction order and were the same for all guns above 6-inch, irrespective of calibers and muzzle velocities. The term appears in all succeeding scores, being changed in value in 1910. The values for some of the ranges are shown:

Range	*1907 Value*	*1910 Value*	*Range*	*1907 Value*	*1910 Value*
4000	0.60	0.94	7000	0.29	0.36
5000	0.48	0.75	8000	0.21	0.26
6000	0.38	0.51	1000	0.10	0.12

The score was called the "Figure of Efficiency," and was the following:

$$\text{For guns: } M = \frac{K\ (HGM)}{P} \qquad \text{For mortars: } M = K\ (HGM)$$

The figure of merit for 1909 and 1910 for the first time contains the constant which makes allowance for the fact that different guns have different rates of fire and other characteristics. This constant has appeared in all scores since that time, being changed almost every year in the attempt to equalize all batteries. For the first two years it was 36 for the 12-inch disappearing carriage, 30 for the 10-inch, 11 for the 6-inch, 5.6 for the 3-inch gun, and 100 for the 12-inch mortar. for these years the material target, 30 by 60 feet, appears to remain to include the practice year of 1912. Only actual hits on this target were counted. Two practices were fired each year, usually separated by several months. No C. M. T. C.'s in those days! The figures of merit were:

$$\text{For guns: } M = \frac{K\ (HGM)}{P} \qquad \text{For mortars: } M = K\ (HGM)$$

It will be noticed that the figures of merit for guns has assumed a form identical with the "A" component of the 1926 score. It was then one hundred instead of fifty per cent.

The figures of merit for 1911 and 1912 again change:

$$\text{For guns: } M = \frac{K\ (HGM)}{P} \times \frac{H}{S}$$

$$\text{For mortars: } M = K\ (HGM) \times \frac{H}{S}$$

The value of hits now vary as the square, evidently to impress the value of hits upon the service. A practice with two hits gets a score four times as great as one with one hit, other things being equal. It was in 1911 that the umpire first appeared upon the scene, to remain with constantly augmented powers until the World War. He was detailed by the War Department, was in charge of all officials collecting data for the analysis, and was the sole arbiter of all disputed points.

In 1912 there appeared an order which seems very queer in this day when the commanding officer must "reply by indorsement" if the time between trial and record shots is greater than ten minutes. For guns, trial shots were assumed to be for the sole purpose of determining the muzzle velocity, and were fired at least twenty-four hours, but not more than two weeks, before the first record practice. When two batteries at the same post manned batteries of the same caliber and model only one set of trial shots were fired and both batteries used the results. Probably many insults were heaped on the head of the battery commander firing the trial shots by the helpless officer who was forced to use the data. Trial shots with mortars were fired the same day as the practice. In this year fire-command and battle practice appears, the second practice of each battery being given over to one of these.

In 1913 the first practice was battery day and the second battery night, with ten rounds for each practice for major-caliber guns and fourteen for mortars. The reaction of the service to the trial-shot system of the previous year must have been unanimous, for the new order said that "trial shots will be fired immediately before and in connection with the record shots." For the first time, mortars were fired in two zones, with about half the shots in each zone. This provision continued through 1914 and 1915 and was then discontinued until revived in 1926. The figures of merit become more complex:

$$\text{For guns: } M = \frac{KH^2}{PgtS\ \sin^2 B} + \frac{375\ L}{D+E}$$

$$\text{For mortars: } M = \frac{KH^2}{gtS\ \sin^2 B} + \frac{50000}{D+E}$$

The maximum for the first term was 75 and for the second 25. The first or hitting term was much the same as the figure of merit for 1911-12, except that the score varied inversely as the square of the mean angle on the track of the target with the line of fire. This angle must not be greater than 70° nor less than 40°. The object of this factor was to make the batteries fire with the target moving as directly

toward or away from the battery as safety would permit. Thus, an angle of 65° would have the effect of multiplying the first term by 1.2, while an angle of 45° multiplied it by 2.0, an increase of 67%. The second term of the figure of merit was absolutely new, and is the first outcropping of what must have been a lively discussion of "lucky hits" and "unlucky misses." This term gives credit to a practice with few or no hits, but with small dispersion and the center of impact near the target. For disappearing guns, ten per cent of the figure of merit was deducted for each five-second period in excess of ten seconds that the gun was not fired after the command "Ready." In that year the pyramidal target was used, and has been until today. The hypothetical target became the section of a battleship twenty yards in length.

The figures of merit for 1914 were nearly the same as for 1913, the principal difference being that the sine of the target angle in the denominator was not squared.

For 1915 and 1916 the figures of merit were somewhat simplified, but retained many of the features of previous years:

$$\text{For guns: } M = \frac{KH}{P \sin B + \frac{gt}{100}} + \frac{500}{E}$$

For mortars the term P was omitted. The principal change is that hits entered into the figure of merit only as the first power, and not squared as it had for several years. The mean absolute deviation disappears from the second term so that no value is given to having the center of impact near the target. Reducing the mean absolute error increased the value of this term.

During the World War, target practices were only incidental to the training, and no new instructions were issued. When regular practices were resumed, the figure of merit had disappeared and district commanders rated practices as "Excellent," "Satisfactory," and "Unsatisfactory" by a general appraisal. The varying standards used and the fact that battalion and regimental commanders, whose recommendations were often taken, were interested parties made this system very inequitable at times. So for 1927 scoring was revived, and an attempt was made to evaluate the many factors of a practice.

One half the score, or 50 points, were for hits per gun per minute, taking into account the normal rate of fire of different guns. The probability of hitting was not taken from a table, but was computed in each case, using the developed probable armament error. While in

1916 credit was given for a small probable error, in 1927 no credit was given, and in many cases there was a positive advantage in having a large probable error. The second, or calibration, component of the score gave the maximum of 10 points if the stripped centers of impacts of the guns were not more than two developed probable armament errors apart. The third, or adjustment, component gave the maximum of 15 points if the center of impact at the end of the practice was within one probable armament error of the target. The fourth, or penalty, component gave a maximum of 25 points if no errors were made by the battery personnel, with penalties deducted for wild shots and for errors in plotting, in spotting, and in applying the rules of adjustment.

For 1928 the score has been modified as a result of the recommendations of all commanding officers. The most striking change is in reducing the maximum value of hits per gun per minute from 50 to 20 points out of 100 and in adding a term, the value of which varies as the square of the shots per gun per minute. Thus, for the first time sheer rapidity of fire will be rewarded. A battery firing at the normal rate will be given 20 points, but if the battery can reduce by one quarter the time necessary to fire one shot 31.3 points will be obtained; and the penalty for slow firing is as great. The other changes in the score make conditions more severe, cover mooted points, and make the penalties greater for a practice fired with fewer guns than a battery should man.

So the scores have grown more and more complex in the attempt to evaluate all the variables in a seacoast target practice. Yet the whole problem is not hard to state: If a battery commander, firing all guns of a well-calibrated battery at the maximum effective rate, reduces the dispersion to a minimum; if he places and keeps the center of impact of the shots as near the target as possible by the use of rules of adjustment mathematically sound; and if all personnel errors are eliminated, then he can do no more. The number of hits and the location of the apparent center of impact at the end of a practice of a few shots are then a matter of pure chance. The Coast Artillery has looked long for an equation that will satisfy these conditions.

What Price Machine Guns?

By CAPTAIN GERALD B. ROBISON, 61ST C. A. (AA)

THE mission of the antiaircraft machine gun battery commander about to fire his battery is to place the center of impact upon the target as quickly as possible and keep it there until the target is destroyed or passes out of range.

It is the purpose of this article to consider—

(1) Whether, at the present time, this mission may be accomplished through rational endeavor;

(2) Whether the results of current antiaircraft machine gun firings throughout the service are all that may reasonably be expected or whether, of their own efforts, the personnel of the batteries could possibly achieve much greater success with the same materiel; and

(3) What, if anything, may be done to improve results.

I

It is our belief that scientific gunnery does not exist unless there is an accurate knowledge of what the materiel will do under standard conditions plus an accurate knowledge of the influence of all non-standard conditions which may obtain. Anything short of this involves observation of fire for the application of arbitrary corrections, *i. e.*, the ignorance factor. This in turn involves tracers and their attendant advantages and disadvantages, largely negatives the value of the known correction factors, and leaves us face to face with the fact that we have no scientific antiaircraft machine gunnery, but shoot as though we were playing a hose on a fleeing child.

What then is the use of knowledge and information pertaining to standard and non-standard conditions? Briefly, our greatest enemy—DISPERSION—whose ugly characteristics we will consider in detail below, is within narrow limits a friend of promise. It appears from the latest tests made by the 61st Coast Artillery that, at ranges beyond which, for any reason, tracers are ineffective, the dispersion is so great that a fairly accurate knowledge of the most important corrections, applied to data computers similar to those supplied for test, would place the center of impact close enough to the target to give more hits than can now be otherwise obtained.

Let us now consider first what is known about standard conditions and second what we do not know about non-standard conditions. For

the information pertaining thereto I am principally indebted to Lieutenant Grayson Schmidt, Coast Artillery Corps.

Knowledge of performance under standard conditions is normally embodied in the range table. It is understood that Mann accuracy barrels mounted on V blocks are used for range table firings. New service barrels mounted in a normal manner are said not to give the same muzzle velocity as the Mann barrels. Rough determinations indicated a decrease in the neighborhood of 75 feet per second. Is this worth checking?

It is understood also that range table times of flight have been taken with a stop watch. These watches are probably accurate, but human reaction time is appreciable so that the accuracy of this method is subject to question. One-tenth second of error in such determination is equivalent to over thirteen feet for a 90-mile-per-hour target, nearly enough to throw the center of impact off the target.

For obvious reasons, no check has been made of high-angle machine-gun trajectories except those at short ranges upon stationary targets. Yet most antiaircraft firings are conducted at a considerable angle of elevation at a moving target, and it is equally obvious that the conditions are not the same and the differences hard to evaluate.

The difference between the times of flight of ball and tracer ammunition is believed not to have been measured. Yet, when fire adjustment is based upon tracers, if they do not follow the same trajectory as the ball, and if, furthermore, they travel with a different velocity, it is clear that there will be both a vertical and lateral divergence of undetermined amounts, due to the rapid movement of the target.

So much for standard conditions. What about the influence of those others which are not standard?

Ammunition deteriorates with age so that its characteristics do not remain standard. What is the correction?

The muzzle velocity produced varies with the powder temperature at the instant of its use. What, again, is the correction?

We have previously mentioned that new service barrels do not provide the standard muzzle velocity, but in addition to this the factor of erosion also plays an increasingly important part with the number of rounds fired through any given barrel. This erosion is itself dependent upon several things besides the number of rounds, as, for instance, the proportion of tracers in the total and individual differences between barrels. Rough determinations indicate that the loss is around 330 feet per second after 8000 rounds. Such an amount is considerable and is bound to have serious influence upon the trajectory. Since, at current prices, a new barrel costs $2.01 less than *one* belt of ammunition

having 20% tracers (to say nothing of loss of effectiveness), we have a strong intimation that it may well be profitable to change barrels after a few thousand rounds, if new barrels, and time, are available.

The sustained fire of which machine guns are capable heats them, as everyone knows. Much less is known as to the influence of these hot barrels upon the muzzle velocity.

We should of course have correction factors for wind.

Aside from personnel errors, the foregoing comprise most of the factors influencing the center of impact. There may be others, but they need not be dealt with herein.

II

As every artilleryman knows, putting the center of impact upon the target and keeping it there is not the same thing, necessarily, as getting 100% hits. We propose now to consider the interesting problem of how many hits we may reasonably expect under certain conditions when this center of impact *is* upon the target, even if it is not possible to give a definite and conclusive answer at the present time due to the fact that no dispersion tests are known to have been made upon targets moving at full velocity at service ranges and elevations. We are thus forced to draw assumptions from the dispersion patterns fired at stationary targets at short ranges but high angles of elevation. Using different gunners of the highest available skill, a caliber .30 gun, heavy tripod mount (255 pounds) and 5600 yard, boat-tailed ammunition, bursts of 25 rounds were fired at elevations of 30°, 45° and 60°. By selecting the B-9 sleeve target, which is 30 feet long, 3 feet in diameter at the mouth, and 5 feet in diameter at its widest point, and reducing these dimensions in such proportion as to show it on our dispersion patterns as though it were 1000 yards away, we find an indicated hit expectancy of 12% at 30°, 15% at 45°, and 10% at 60°. But these figures must be modified. TR 150-35, par. 43 *b* states that for a caliber .30 gun on an infantry type tripod mount (which it must be remembered is clamped in azimuth and elevation for such firing, as opposed to the free gun in antiaircraft firing) the shot group will form an oval about 2½ inches high and 2 inches wide when properly fired at 1000 inches, and par. 43 *c* states that the pattern on a vertical target at 1000 yards will be about 40 feet high and 9 feet wide. This indicates that the dispersion does not increase in direct proportion to the range but much faster, particularly the vertical dispersion. There is nothing startling about this since it is in entire accord with our target practice results, *i. e.*, a rapid fall in the percentage of hits with increase of range. If we now reduce our target

dimensions in this indirect proportion, our actual hit expectancy becomes 3% at 30°, 6% at 45°, and 4% at 60°. These figures are probably a little too high for several reasons; namely, (a) that with a free gun the lateral dispersion increases more rapidly than indicated above, and (b) they do not include the effect of dispersion in time, that is, differences in the times of flight of successive bullets. Conversely, if we convert these hits to those we would theoretically obtain on the allowed service target of 170 square feet they would be increased to 4.7% at 30°, 9.4% at 45°, and 6.2% at 60°.

These, then, are the final percentages as accurately as we may evaluate them from present information. We may feel reasonably certain that the true value is less rather than more for the reasons given above. But it should perhaps be emphasized at this point that these hit expectancy percentages do not mean that it is impossible ever to get a higher percentage under present conditions, but that such shoots will offset an equivalent number where the percentage is less through no fault of the gunners. Thus, if the percentage is above the expected, the shooting was both well conducted and lucky. If the percentage is below the expected, the shoot could have been as well conducted and unlucky or, of course, it could have been poorly done. Such a matter would be difficult to determine.

It is noticeable that firing appears to be more accurate at 45° than at 60° or 30°. Since much, if not most, of our firing is done below 30° we may well be concerned about this sharp decrease and ask what does happen between 0° and 30°. A series of patterns made in a manner similar to the high-angle patterns (except that regularly issued service ammunition and issued antiaircraft tripods were used) were made at 1000 inches and 0° elevation. These give a calculated actual hit expectancy at 1000 yards of about 13.2% on the sleeve, or a theoretical expectancy on full size target of 20.6%. That considerable reliance may be placed upon these short-range firings and our method of calculation is indicated by a comparison with a dispersion test of similar gun, mount, and ammunition fired at 1000 yards by the 61st Coast Artillery in 1926. This showed that we would have had 13.4% of the shots through our target and a theoretical expectancy on a full size target of 20.9%—a closer check than we have any right to expect.

These materially increased percentages at 0° elevation are encouraging and indicate that for some reason the 30° elevation is a critical point. The matter should be investigated further either to disprove or confirm, and means should be sought to correct it if finally determined to exist.

III

There remains the problem of what should be done to achieve important increases in the percentage of hits.

It is submitted that all existing evidence, although it may be insufficient to be conclusive, indicates that well trained antiaircraft machine-gun batteries get about the percentage of hits that may reasonably be expected with the present materiel. Further, that in any case, their best future endeavors can not result in an increase of more than a few per cent.

It is believed that these data also show that machine-gun data computers will increase the percentage of hits obtainable at the longer ranges where present observation of fire becomes difficult. But it is likewise maintained that a perfect data computer will do no more than place the center of impact upon the target and keep it there; that this will produce less than 5% hits at ranges beyond 1000 yards so long as the dispersion remains what it is; and finally, that it will not even do this unless there is reasonably accurate information about standard and non-standard conditions.

Lastly, it is submitted that the dispersion for antiaircraft machine guns is unwarrantedly excessive and that no hope of radical improvement in fire is justified until it is greatly reduced. It is a problem absolutely fundamental, one which takes precedence over data computers, range finders, and all else, and one in the solution of which no reasonable amount of money and effort should be spared.

MAXIM XXIII

When you are occupying a position which the enemy threatens to surround, collect all your force immediately, and menace him *with an offensive movement. By this maneuver you will prevent him from detaching and annoying your ranks, in case you should judge it necessary to retire.—Napoleon's* Maxims of War.

The British Merchant Marine

By CAPTAIN FRANK H. HASTINGS, C. A. C.

THE primacy of Great Britain in the merchant shipping of the world is too well known to require comment. The merchant marine of Great Britain has ranked first among the merchant navies of the world for several centuries and only once during the past hundred years has its supremacy been threatened. In 1850 the total tonnage under the British flag exceeded that of the United States by only three-quarters of a million tons and in 1860 by only one-quarter.

Since 1850 the development of the British Merchant Marine is indicated by the following tonnage figures: The net tonnage in 1850 was 3,565,133 tons, of which 3,396,659 were sailing vessels and 168,474 were steam. In 1885 the net tonnage of sailing vessels was 3,456,562 and of steam vessels 3,973,483. Just before the outbreak of the World War the sailing vessel tonnage had decreased to 864,504 tons and steamship tonnage increased to 11,273,387. The potential net tonnage had increased from 3,902,081 to 34,666,665 tons.

The extensive development of the merchant marine of Great Britain may be accounted for in various ways. In all cases however, it is necessary to go back several centuries in the history of the world—at least to the beginning of the colonization period, when Spain and Portugal by reason of their early discoveries and settlements in America were most favorably situated among the nations of Europe. The trade and shipping of Spain prospered remarkably as long as the precious metals of Mexico and Peru were to be found in great abundance, but the pursuance by Spain of a false economic policy whereby that country sought to monopolize all of the trade of her rich colonies proved disastrous, since it did not provide for the development of manufactures in Spain. The gold and silver of Mexico and Peru were paid directly to the merchants in Spain, but much ultimately went to the manufacturers of Great Britain who supplied the bulk of wares sent out in Spanish ships to Spanish colonies. This policy, while disastrous to Spain, proved a great stimulus to the development of the domestic industries of Great Britain.

This was, moreover, the period of the Elizabethan seamen, when Frobisher, Drake, and Hawkins made great voyages of exploration and discovery as well as piratical raids upon the gold-laden ships of Spain, and not only brought home to England rich booty but stimulated inter-

est in lands and trade across the seas, which led to the great colonial enterprises of that country.

The opportunities for British enterprise were made even better by the destruction of the Spanish Armada in 1588. This was almost a death blow to Spanish shipping, for it should be remembered that until comparatively recent years the navies of the world were composed mainly of merchant ships.

The development of the American colonies and the monopolization of trade between Great Britain and the American and other colonies under the regime of the navigation laws led to a still greater development of the British Merchant Marine, which was accelerated by the acquisition of Canada and India in 1763 as a result of the Seven Year's War. The acquisition of East India brought about an important addition to British trade and shipping.

From these facts we may deduce that three of the main causes for the development of the British merchant marine were (1) the early development of British industry; (2) the acquisition of extensive colonial possessions; and (3) the monopolization of trade with the colonies. These three factors gave the British Merchant Marine such a great advantage over the shipping of other countries that for the last three centuries it has been subjected to keen competition from only two countries—the Netherlands in the latter part of the 17th century and the United States in the first half of the nineteenth century.

During the first half of the nineteenth century, or until the repeal of the old navigation laws, British merchant shipping was at a disadvantage as compared with that of the United States, chiefly by reason of the fact that ships could be built more cheaply in this country because of the greater supply of the necessary raw materials. The building of sailing ships became one of the important industries in America, and great skill was attained in their construction, the American clipper ship being the fastest and most efficient sailing vessel on the seas at that period.

The rivalry of the United States did not continue long, for about the middle of the nineteenth century steamships of iron and steel construction were introduced. The iron industry of England had been extensively developed for a number of years as a result of the fact that processes of iron and steel manufacture had been perfected by English inventors. Moreover, the application of steam to industry was further advanced in England than in the United States. England had, therefore, in the manufacture of iron steamships an advantage similar to that which the United States had had in the manufacture of wooden sailing vessels, and it is not surprising that with the increasing use of

the former the merchant shipping of Great Britain was subjected to less and less competition from that of the United States.

Other reasons helped to account for the decline of American shipping. During the Civil War many American ships were destroyed, while many were transferred to foreign registry in order to avoid capture by the Confederate cruisers, and were not allowed to return to American registry after the War. The opening up of the West, the building of railroads, the development of manufacturing industries, and other domestic enterprises proved more absorbing and offered richer rewards than ocean shipping, which had been one of the chief industries until the outbreak of the Civil War.

The causes of the growth of the British merchant shipping have been referred to in some detail because of the fact that it has been ascribed by many writers to the policy of Government aid and in particular to the policy of granting postal subventions beginning with the establishment of the Cunard Steamship Line in the trans-Atlantic trade in 1839.

At no time in its history had Great Britain paid a general bounty on the construction or operation of merchant ships. Its financial aid has been limited to the payment of fixed amounts for the regular transportation of British and colonial mails on specified routes by companies with which special contracts have been made. No general bounties have been given, as in France, Austria, Italy, and Spain, for all vessels built in domestic yards or for all vessels operated under the national flag. In fact the direct financial aid extended by the British Government has at no time reached more than five per cent of the total tonnage under the British flag, and has not benefitted the hundreds of cargo ships which have been the main source of strength of the British merchant marine and the chief reliance of British industry and trade.

The great bulk, 95 per cent or more, of the total tonnage under the British flag has long consisted of ships which have received no subsidy but owe their success and earning power to the fact that England has been able to build steamships more cheaply than any other nation, and because the great trade of England in all parts of the world provides them with full cargoes for most of their voyages.

British enterprise is shown clearly by the fact that British shipyards have long since standardized the manufacture of cargo vessels, just as the American yards on the Great Lakes have done with equal success with respect to ore and coal carrying ships. Standardization has meant lower cost of construction, which, in turn, has meant lower interest,

insurance, and depreciation charges, and therefore lower cost of transportation.

The possession by England of the bulk of the world's over-seas trade not only gave British ships ample cargoes but also made it possible for English ship-owners to lay out the trade routes so as to insure fullest possible cargoes for their ships at all stages of their voyages. For example, steamers leave London with general cargo for Brazil; take on a cargo of coffee at Santos for delivery at New Orleans; take on a cargo of compressed cotton at New Orleans, naval stores at Pensacola or Savannah, and bunker coal at Norfolk; and return to England. Under such an arrangement these steamers have full cargoes on each leg of the triangular course, and work for British industry on two legs of the voyage.

The maintenance by England of coaling stations in all parts of the world and her possession of the superior coal of Wales, which lies close to the seaboard and can be delivered with little or no rail freight, insures return cargoes for the ships bringing raw materials to England.

The only instance of a Government loan to a shipping company is that made to the Cunard Steamship Company under its contract of July 30, 1903. This contract, in addition to providing for postal and admiralty subvention, provided for a loan of £2,600,000 at the low rate of 2¾ per cent, to be repaid in 20 years. The Government took a blanket mortgage on the entire fleet of the company, as well as a pledge of its other property, as a guaranty of the loan, and also became the purchaser of one share of £20. The primary object of this loan was to enable the Cunard Company to build two large steamers of a speed of at least 25 knots for the north trans-Atlantic trade for the purpose not only of competing successfully with the newly organized International Mercantile Marine Co., an American corporation, and the German lines, but also to provide auxiliary cruisers of a fast and serviceable character. The British Government was anxious to keep the Cunard Line out of the International Mercantile Marine Co., and the loan was one of the inducements to the Cunard Company to remain a "purely British undertaking."

The protection of seaborne trade has always ranked among the primary functions of the British Navy, but since the industrial revolution at the end of the eighteenth century its importance has immeasurably increased. Deprived of that trade Great Britain could neither maintain her industries nor equip her armies, nor feed her people. The maintenance of Maritime communications was, in August, 1914, a consideration every whit as vital as the denial of passage to an invading force.

The steps by which British and allied commerce was encouraged and protected, the measures adopted to check panic on the marine insurance market, and avert the laying up of shipping, the sweeping of the enemy's merchant flag from the sea, and the slow strangulation of his foreign trade, may lack, in general, the spectacular interest and vivid drama of actions such as those which took place off the Falklands or the coast of Jutland, but even their routine developments are equally significant in the history of the World War.

It was, of course, for Great Britain herself that both the monetary value of the interests exposed to attack and the relative importance of those interests to the national strength reached its maximum. During the three years which immediately preceded the war the average value of goods annually imported into the United Kingdom for home consumption was £623,000,000 of which £263,000,000 represented food, drink, and tobacco, and £205,000,000 raw materials for use in British factories. A considerable part of this total was received in payment of interest on British investments abroad or in return for shipping, banking, and insurance services rendered to foreigners. The pay for the remainder, British produce and manufactures were exported to the extent of nearly £489,000,000 annually. In addition, foreign and colonial produce to the value of £108,000,000 a year was consigned to this country and subsequently re-exported to other destinations.

While the first essential in time of war was to secure the safe passage of food and raw materials, there were also certain manufactured articles of a specialized character, such as aniline dyes and optical instruments, for which Great Britain was almost wholly dependent on foreign countries. Moreover, the vast expansion called for in military equipment and the enormous accumulation of munitions and war material necessitated by the conditions of modern warfare, strained the manufacturing resources of the country to the utmost at an early stage of the conflict, and involved large purchases abroad. In order to avert a collapse of the national strength it was essential that each of the three great branches of the import trade should be maintained, and scarcely less important was the maintenance of outward-bound traffic, for it was only by the uninterrupted flow of exports that imports could be paid for and unemployment and distress amongst the industrial population avoided without incurring crushing indebtedness to the producing countries.

The total weight of commodities imported during 1913 has been estimated at 55,000,000 tons and that of exports and re-exports at 100,000,000, including 76,000,000 tons of coal. It can safely be assumed, therefore, that the trade of the United Kingdom involved an-

nually the lifting of cargoes amounting to over 150,000,000 tons.

In addition, the coasting traffic of the United Kingdom, which was carried on almost entirely under the British flag, involved the lifting of some 70,000,000 tons annually and was a very important factor in the distribution of imports.

The carriages of these cargoes involved, as shown by the entrances and clearances in the foreign trade at ports in the United Kingdom, an average of 47,000 laden voyages inward and 61,000 outward each year, of which 26,000 and 31,000 respectively were made under the national flag. The proportion of the total trade carried by British ships was, however, much higher, whether as regards volume or values, than these figures would suggest. Their average size was greater than that of their foreign competitors, their average cargoes, especially in the import trade, were more than proportionately heavier, and they were responsible for the distribution of the greater part of the more valuable exports. Taking all these factors into account, their total share in maintaining the commerce of the United Kingdom may safely be put at 74%.

The mercantile fleet by which these functions were performed reached on July 1, 1914, a total of 8587 steamers and 653 sailing vessels, with a tonnage of 19,250,000; and the total tonnage under the British flag, including ships owned in the Oversea Dominions, was 21,000,000 or about 43 per cent of the world's shipping. In the larger classes of ocean-going steamers, British predominance was still more pronounced, and in the actual carrying power the total tonnage under the British flag was at least equal to that of all other countries put together.

The total value of the steam tonnage owned in the United Kingdom and engaged in foreign trade was estimated in 1911 to be £127,000,000 and at the outbreak of war it was probably in the neighborhood of £150,000,000. To this figure must be added, in estimating the extent of British interest afloat, the value of the cargoes, both British and foreign, carried by the ships; for even the foreign cargoes were mostly insured on the London market. It will be seen that the value of British cargoes afloat, whether in British or foreign bottoms, averaged £100,000,000 a month, and the total value of all cargoes carried by British ships during 1913 has been estimated at £1,800,000,000.

The number of ships engaged in British trade was so great that a score of captures, while it might bring serious loss to individual owners or underwriters, would represent only a insignificant percentage. So world-wide was British commerce, that even the temporary closing of a minor task could be looked upon with comparative indifference, so

long as the safety of the main trade routes was not compromised.

To the Allies the free movement of British shipping was only less important than to themselves, for while all were dependent to a varying degree upon seaborne trade, no one of them possessed a mercantile marine of sufficient size to carry that trade without being supplemented by the services of vessels flying foreign flags, nor had they, like the British, a large reserve of surplus tonnage engaged in traffic between foreign ports, which could be drawn into their own trade should need arise. All were dependent, in greater or less degree, upon the ability of British shipowners to continue their activities in the general carrying trade.

British tonnage loss was heavy during the latter part of the World War, but in the period since then it has increased to practically the same amount as 1914. It was because of the necessity to find overseas markets that the mercantile marine came into being; it was because of the possession of cheap coal that Great Britain was able to assume a leading position as the World's supplier and carrier.

Today the situation has altered in its very essentials. World trade has contracted, following the disastrous European war. British coal is no longer cheap, while the power resources of other countries are fast being developed. Furthermore, the great expansion in the use of oil-fuel both as bunkers and in motor ships has seriously affected the coal export industry of that country. The motorships and steamers fitted for oil-fuel burning now in existence would, if using coal, require (in normal trading conditions) bunkers corresponding to, say, one-sixth of the total coal raised in Britain for all purposes, or roughly one-half of the coal exported from that country either as bunkers or as cargo. While of course the whole of the decrease from this cause is not borne by Great Britain, it is inevitable that a serious contraction in the coal export of that country should result.

Shipbuilding and shipping industries are vital factors in the problems which are at present vexing statesmen and industrialists the world over. Correctly interpreted, movements in world shipping and shipbuilding form one of the best guides in assessing the trade position at its true significance. The total of effective merchant shipping in the middle of the year of 1914 amounted to 42½ million tons; by the middle of 1926 this had increased to over 59 million tons. In the British Empire, however, the tonnage had remained approximately stationary. The outstanding feature of the figures is the expansion of the United States merchant fleet from under two millions to over 11 million gross tons.

The world is producing and using, roughly, three times the quantity of oil which was produced in 1913, and the transport of this huge quantity has called into being a new arm of the world's merchant service. In 1914 only some 1½ million tons of oil-tank steamers were in existence, whereas in 1925 this total had increased to over 5 million gross tons, while nearly half a million tons have since been added. The share of the British Empire in the oil-carrying trade of the world is very little short of that of the United States, and that of the British Empire and the United States together account for nearly four-fifths of the total for the world.

Although the total tonnage owned in the United States today is over 600 per cent greater than in 1914, the comparable tonnage actually in employment is only some 2½ times the pre-war figure. The tonnage in employment in Great Britain is some 10% less than in pre-war days, which is probably a fairly correct indication of the relative trade of the country. The remaining countries of the world show a considerable increase in employed tonnage, and since world trade has decreased in volume since the pre-war days, it is to be inferred that the world's tonnage is not so well employed as it was in 1914; in other words the efficiency of the fleet has been reduced.

The acute depression in the last six years has been responsible for a number of ships being retained in service long past their usual economic life. This is one of the main factors which have diminished the efficiency of the fleet as compared with pre-war days. Statistics show that there has been a persistent and disquieting increase in the percentage of the world's fleet which is over 25 years of age. In this respect the United Kingdom is in a better (distinctly) position than other countries, while Italy, Japan, Spain, and Denmark are responsible for the majority of the increase.

Summing up the past year, Sir Westcott S. Abell says (in Brassey's *Naval and Shipping Annual*): "The past year has been both confusing and depressing as regards the world's merchant marine. The war exaggerated the trade depression which was already foreshadowed by the beginning of 1914, and at the same time is accelerated to an alarming extent the construction of tonnage; and although the maritime world is gradually realizing the cause of its real difficulties, there is very little evidence of any general tendency to deal with the problem promptly and courageously. Apart from a very general desire for artificial stimulants in the form of subsidies, the doctrine of 'laissez faire' seems to be almost universal, except for the somewhat hysterical acclamation of the motorship as the panacea of all our difficulties.

"This is a condition which cannot continue indefinitely; the longer a return to efficiency in sea transport is delayed, the harder will it become, and no revival in world trade can result in any real return to prosperity in shipping and shipbuilding unless the world's mercantile marine returns to a state of efficiency at least comparable with that which existed prior to the war.

"The one cheerful element during the past year has been the growth of cooperation within the shipping and shipbuilding industries. Our only hope of extrication from the present difficulties lies in the extension of that movement, actuated as it is by joint sacrifice and good will. That alone is paving the way to such an understanding of our problems as will enable our merchant marine to become the competent handmaiden of international commerce."

MAXIM XLIII

Those who proscribe lines of circumvallation, and all the assistance which the science of the engineer can afford, deprive themselves gratuitously of an auxiliary which is never injurious, almost always useful, and often indispensable. It must be admitted at the same time, that the principles of field-fortification require improvement. This important branch of the art of war has made no progress since the time of the ancients. It is even inferior at this day to what it was two thousand years ago. Engineer officers should be encouraged in bringing this branch of their art to perfection, and in placing it upon a level with the rest.—*Napoleon's* Maxims of War.

Subsidized Merchant Marine

By CAPTAIN D. W. HICKEY, C. A. C.

THE United States Merchant Marine Act of 1920, read in part. "It is necessary for the national defense and for the proper growth of its foreign and domestic commerce that a nation shall have a merchant marine of the best equipped and most suitable types of vessels sufficient to carry the greater portion of its commerce and serve as a naval or military auxiliary in time of national emergency."

The leading nations of the world believe in this doctrine or doctrines of similar intent, and give assistance to their merchant marines.

DEFINITION OF TERMS

In this discussion "subsidy" and "bounty" and "bonus" are treated as synonymous terms and are used to describe grants that are made without any requirement of special service to the government. The term "subvention," on the other hand, is used to describe grants that are conditioned upon the performance by the grantee of certain prescribed services for the State, such as the rapid transportation of mail on regular schedules, and the construction of merchant ships according to plans of the naval authorities and for use as auxiliary cruisers and transports in time of war.

GENERAL

Government aid to shipping takes many forms, direct and indirect. Some examples of government aid to shipping are, reservation of coasting trade, exemption from import duties on shipbuilding materials, admission of foreign built vessels to national registry, preferential railway rates, loans to shipowners, reimbursement of port and canal dues, exemption from taxation, construction bounties, navigation bounties, and postal subventions.

Many nations reserve their coasting trade to their own ships, or grant the privilege of the trade to ships of nations which grant reciprocal privileges. France has long reserved coasting trade to national ships, while Japan has reserved all of its coastal trade to its own ships since 1910.

In order to encourage shipbuilding at home, most nations have exempted shipbuilding materials from import duty. Japan does this. France taxes shipbuilding materials, which come in from foreign countries, but makes up for the tax by granting liberal shipbuilding bounties.

France has gone so far at times into the free ship policy (has granted registers to foreign built ships) as to pay bounties on such ships. Japan's first gains in merchant tonnage were due to the purchase of foreign vessels, and she still buys ships of foreign construction.

Another method of aiding merchant shipping is by means of preferential railway rates. Lower railway rates are charged on goods shipped over certain steamship lines. France is one of the nations which practices this form of subsidy. The benefits of this form of assistance are two-fold.

It enables the manufactures to sell his products at a lower price in the countries reached by these lines, and at the same time increases traffic on the preferred lines.

Loans to ship owners at low rates of interest, or without interest are not in general favor, however, such forms of aid have been practiced in Austria and in Russia.

Exemption from taxation, as an indirect aid, has been granted only in Austria and Hungary.

Reimbursement of port dues and canal dues are not generally practiced, but France has made reimbursement of Suez Canal dues to certain of her steamship lines.

The granting of postal subventions to steamship lines antedates the bounty or subsidy system and is in more general use throughout the world. The first formal mail contract made by the French Government was in 1851, and since that time, this form of aid has been in general use in France. The greater part of the aid France has given her steamship companies has been in the form of mail subventions. Japan has resorted to this method of aiding her shipping industry, and today most of her assistance is given in this form. The mail contracts have always been exacting as to speed, ports of call, sailing time, schedules, and now are specifying special equipment, such as wireless telegraph. The tendency has been to extend the requirements until now the ordinary mail subvention contract gives the Government not only a very large control over the company's affairs, but also an active participation in its deliberations and in its profits. In Russia and in Austria, the Government went so far as to name some of the directors of the companies. In both France and Japan, the contracts with the leading steamship lines give the Government as much control as it is possible to give over privately owned lines.

General bounties or subsidies to merchant shipping are of comparatively recent origin. The system of paying general bounties to shipping may be said to have been instituted by France, which entered

upon this policy in 1881, and has made more extensive use of bounties than has any other country.

POLICY OF GOVERNMENT AID, FRANCE

The first subsidy law in France, that of January 29, 1881, was adopted after careful consideration by a special commission and was intended to assist the domestic ship building industry as well as the shipping under the French flag. It was hoped that the bounties provided under this law would check the decline in the French merchant marine that had been going on steadily since the steamship became the principal carrier of the world's overseas trade.

Prior to the subsidy law of 1881, shipbuilding materials were admitted free of duty. One of the principal objects of that law and succeeding laws has been the development of an extensive shipbuilding industry in France. It is not surprising, therefore, that the French Government has since that time imposed import duties upon foreign-built ships and ship-building materials.

The law of 1881 provided construction bounties for ships built in France, on a sliding scale, from $1.93 per gross registered ton for small wooden vessels to $11.58 per ton for iron and steel ships. In addition, a bounty of $2.32 per 100 kilo was for new engines, boilers, and auxiliary machinery, and of $1.54 per 100 kilo for new material used in renewing boilers and engine equipment. Navigation bounties were paid only to vessels in the overseas trade. French-built ships received $0.29 per net ton for each 1000 miles travelled during the first five years operation under the law, and this amount decreased annually until it became 50 per cent of the original bounty. The government further offered half the navigation bounty, or about $0.15 per ton per 1000 miles, for ships purchased abroad by her citizens and carrying the French flag. There was consequently a feverish stimulation at once given her own ship building as well as competitive activity in British shipyards.

This law was in effect for 12 years, and resulted in the expenditure of over $6,000,000 by France for construction bounties, and over $17,000,000 for navigation bounties. It caused substantial increases in steam tonnage, but this gain was nullified to some extent by losses in sailing tonnage, so that the net gain in merchant tonnage was not great. Moreover, it is claimed that the French constructors took advantage of the opportunity offered by the law and arbitrarily increased the price of ships so as to absorb practically all of the higher rate of navigation bounty paid to French ship owners. At any rate, the law was considered a failure.

A new law, passed in 1893, increased the construction bounties about 10 per cent, abolished the navigation bounty to all foreign built ships, and granted navigation bounties to coastwise shipping, at two-thirds of the rate received by the overseas vessels. The result of this law was as unsatisfactory as was the result of the law of 1881. It was found that large lines of sailing vessels were sailing around the world in ballast, making profits for their owners, from the liberal navigation bounties. Under this law France expended over $17,000,000 for construction bounties, and over $50,000,000 for navigation bounties. No appreciable increase in tonnage resulted. The law did, however, make the merchant marine sailors subject to service in the navy during time of war.

In 1902, another subsidy law was passed. It continued without change the construction bounties granted by the law of 1893. It provided two classes of navigation bounties, one for French-built ships and the other for vessels of foreign construction. However, the foreign built ships had to be equipped and owned in France. This bounty was, therefore, termed an equipment bounty. Vessels in the coasting trade received bounty at a rate which was two-thirds of that received by overseas ships. Provision was made to limit the bounty paid to sailing vessels. The law provided a limit on the construction bounty of $10,000,000. The result of this law was a great rush on the part of ship owners to order vessels built during the first years of the operation of the law, in order to get in on the bonus, and stagnation in ship building thereafter.

France further modified her subsidy laws in 1906 and in 1912, and is still unsatisfied with the results obtained.

During the entire period under discussion France paid out approximately $5,000,000 per year in postal subventions to her steamship lines.

France has spent vast sums each year in her efforts to build up her merchant fleets. Her expenditures by year from 1881 to 1913 are:

1881	$ 759,000	1892	$ 6,735,000	1903	$11,114,000
1882	2,123,000	1893	7,015,000	1904	12,273,000
1883	2,244,000	1894	7,195,000	1905	12,042,000
1884	2,524,000	1895	7,250,000	1906	12,165,000
1885	1,679,000	1896	7,694,000	1907	12,196,000
1886	2,043,000	1897	8,233,000	1908	13,164,000
1887	1,846,000	1898	3,168,000	1909	12,218,000
1888	2,009,000	1899	3,920,000	1910	12,148,000
1889	7,147,000	1900	4,745,000	1911	11,827,000
1890	7,028,000	1901	10,511,000	1912	7,426,000
1891	6,902,000	1902	11,934,000	1913	6,984,000

France's shipping increased from 1870 to 1926 as follows:
Shown in Thousands of gross tons.

1870 1072	1907 1403	1917 2216
1880 919	1908 1452	1918 2029
1890 944	1909 1444	1919 2234
1900 1038	1910 1452	1920 3245
1901 1111	1911 1463	1921 3652
1902 1218	1912 2053	1922 3846
1903 1235	1913 2201	1923 3737
1904 1349	1914 2319	1924 3498
1905 1387	1915 2286	1925 3512
1906 1401	1916 2216	1926 3491

France has been called the "Bounty giving nation par excellence." The policy of granting aid to merchant shipping of France has been so long in operation as to have become virtually a tradition. The policy of granting mail subventions was instituted on a formal contract basis as early as 1851 and has been in force since that time. The bounty system was not introduced until 1881 and has been in force since that time, although a number of important changes have been made in the original scheme. Each succeeding subsidy has been more exacting than the preceding one. The amendments however, do not appear to have had the desired effect, for no substantial benefit has resulted from the large amounts expended. As has been stated before, France has attempted by the payment of liberal bounties to overcome serious handicaps of her present economic condition.

If Government aid could of itself create a large merchant marine, France should today have one of the largest. The fact is, however, that the French merchant marine has not held its own in the international competition. In 1860 the French shipping was outranked only by that of Great Britain and the United States. By 1880 the French marine had been passed by the Norwegian, German and Italian merchant navies. In 1910 the merchant navies of Great Britain, the United States, Germany, Norway and Japan outranked that of France. Now, the merchant fleets of Great Britain, the United States and Japan are larger than those of France.

The geographic situation of France—the nearness of its shores to transoceanic countries was of great advantage to French ship owners in the days of sailing ships, but is of no advantage now, since it does not cost much more to carry a ton of merchandise by steamer from Japan to Antwerp or Hamburg than to Havre or Marseille. Steamers coming from America incur only a slight increase in cost if they proceed directly to Hamburg instead of stopping at Havre. And the

freights by sea being so much lower than those by rail, the manufacturers prefer to have their incoming cargoes unloaded or outgoing cargoes loaded, at the port nearest them.

The French coast, about 1550 miles in extent, has a large number of ports many of them at considerable distances from industrial centers. A large number of ports was an advantage in the days of sailing vessels, when cargoes were small and loading and unloading slow. At present a large steamer loads in a few hours a cargo which formerly would have been distributed among several vessels. Modern commerce tends, therefore, toward centralization in a few large ports, such as London, Liverpool, New York, Hamburg, and Antwerp, where accommodations are extensive and the cost of maintenance correspondingly low. In France the cost of maintaining the small ports absorbs the profits made by the large ports, and this results in higher charges. In some ports a French ship will not find a sufficient cargo, this resulting in an advantage to a foreign ship coming in partly loaded and seeking only a partial cargo. Repairs and provisions can be had at a small port only at higher prices and with loss of time, which may be a serious factor for a large steamer.

In order to have a prosperous merchant marine, a country must possess a flourishing ship-building industry, and be able to furnish cargoes both ways. France does not possess the raw materials necessary for ship building; moreover, her shipbuilders, having but few ships to build, must necessarily operate at a higher cost and reduced speed. Large production decreases the costs. In France the cost of ship building is much higher than in England.

The receipts from freights are dependent on the weight and volume of merchandise. The merchant marine depends on heavy and cumbersome goods, whereas France exports chiefly light and costly goods. In 1896 the average value of a ton of goods exported by sea was $145 in France, $52 in Antwerp, $35 in Hamburg, $64 at London, and $41 in Glasgow. In that year France exported 3,549,836 tons, England 52,500,000 tons, or fifteen times as much, and Germany 21,000,000 tons, or six times as much. The port of Antwerp alone exported 1,800,000 tons, or more than one half of the total French exports.

Lack of outgoing cargoes obliges French ships to charge higher rates, as the outgoing trip brings them hardly any profit. Foreign ships divide their earnings between two trips. The lack of French commercial establishments abroad is another reason why French ships cannot find sufficient cargoes, as the foreign houses give preference to ships of their own flags.

France has made frequent and costly experiments with various forms of bounties without accomplishing the results hoped for. Some of the results obtained by certain of the bounties have been far fetched, as, for example, the development of great fleets of sailing vessels which found it profitable, under the liberal navigation bounties provided by the law of 1893, to sail around the world much of the time in ballast.

By reason of extensive experiments the French system has undoubtedly been improved. With each new law on the subject the requirements have become more exacting. Although the results obtained under the bounty systems of France have not been encouraging, these systems nevertheless have been used as models by Italy, Austria, Hungary, Spain, and Japan.

POLICY OF GOVERNMENT AID, JAPAN

The shipping industry is one of the most important in Japan, holding from time immemorial a prominent place in the commerce of the country. The reason for this is found in Japan's insular position, her extensive seaboard, and her mountainous interior. During the middle ages the Japanese were distinguished among Oriental nations for their spirit of maritime enterprise. Korea, China, Formosa, even the distant Philippine Islands, Cambodia, and Siam saw the Japanese appear on their coasts, now as peaceful traders, now as buccaneers.

It is evident, too, that the Japanese of the early part of the seventeenth ceuntry were determined not to be left behind in the art of ship building. The English master-mariner Will Adams, who came to Japan in the year 1600, built ships for the Shogun, one of which made voyages to Manila and even to Mexico. Suddenly all was changed. Alarmed beyond measure at the progress of Catholicism, and fearing that in Japan, as elsewhere, the Spanish monk would be followed by the Spanish soldier of fortune, the Shogun issued an edict in the year 1636. whereby all foreign priests were expelled from the empire, foreign merchants were restricted to the two southwestern ports of Nagasaki and Hirado, and all Japanese subjects were forbidden under pain of death to leave Japan. All large vessels, both of foreign build and of native build, were destroyed.

When the feudal government fell, the restrictions on ship building fell with it. The new government took an interest in merchant marine of foreign build.

The industrial development of Japan since that country adopted European methods of manufacture and commerce has been remarkable, and accounts in a large measure for the development from almost

nothing, and shows a remarkable rate of increase for that reason. The construction and operation of steamships were new industries in Japan. Both had to be inaugurated and built up. The Japanese Government realized that if she intended to build her own vessels she must foster ship building industry until her people had learned the European methods of manufacture, and if she intended to operate merchant vessels in competition with those of European countries she must assist Japanese owners. So eager was Japan to have her shipping increase along with her trade and to extend the influence of Japan in the affairs of the world that the artificial stimulus of a liberal bounty system was considered necessary.

The original grants were mail subventions to promote steamship services in the adjacent Far East.

Japan's first subsidy law was passed in 1896. It provided construction bounties for "any company composed of Japanese subjects exclusively as members and shareholders which shall establish a shipyard conforming to the requirements of the Minister of Communication and shall build ships." The bounties varied from $6.00 per gross ton, to $10.00 per gross ton, depending upon the size of the ship. In addition, a bounty of $2.50 per horsepower was granted for the installation of engines constructed in Japan. Navigation bounties were granted for iron and steel ships owned exclusively by Japanese subjects, and plying between Japanese and foreign ports. The bounties varied according to the size of the vessel, the speed, and the distance covered. These bounties were paid not only to vessels built in Japan, but to foreign built ships less than five years old, owned by Japanese.

The act of 1896 provided for 15 subsidized routes calling for an annual expenditure of $2,500,000 when fully operative. The payments were given ostensibly for postal service, but were computed at the mileage rate given for navigation bonuses and might therefore be regarded as a special navigation bounty or subsidy, especially since the amount of mail then carried was insignificant.

The result of this law was a great increase in tonnage and ship travel. It became necessary because of the heavy financial burdens imposed by these large subsidies, to amend part of the act in 1899.

Under the amendment of 1899, foreign built vessels received only one half of the bonus they had received under the old law. Furthermore, the mail subventions were made as flat guarantees.

The next change in the subsidy laws of Japan came in 1910. Under the new law, the old was modified by providing a reduced bonus for vessels as they grow older, and granting larger bonuses for ships built according to government specifications. The new law also provided

that the subsidized ships must carry apprentices, and gave the Government a large measure of control over such lines. The law of 1910 also provided that in order to receive construction bonuses, ships must be made of steel, must be over 1000 gross tons, and be built according to specifications approved by the Government.

In 1917 the shipping laws were again changed. This time the changes were so as to encourage the establishment of regular lines to Australia, North and South America, and Europe. It became necessary for subsidized companies to secure the approval of the Minister of tariff schedules, and passenger rates, and to equip their ships with wireless telegraph.

In 1922 further restrictions were placed on bounties and subsidies by Japan, when she realized that a large part of her subsidy was being expended in carrying foreign cargoes from China to America.

Japan has been generous to her steamship lines since the inauguration of the bounty system of aid. Her expeditures from 1897 for all types of government aid are:

1897 $ 626,000	1904 $1,259,000	1911 $6,828,000
1898 1,879,000	1905 1,285,000	1912 6,800,000
1899 2,639,000	1906 3,358,000	1913 7,000,000
1900 2,734,000	1907 4,362,000	1914 7,000,000
1901 3,420,000	1908 4,995,000	1915 7,000,000
1902 3,607,000	1909 6,057,000	
1903 3,607,000	1910 6,525,000	

1916-1926 more than $4,000,000 per year.

Her shipping increased from 1880 to 1926 as follows:
Figures show 1000's of gross tons.

1880 89	1908 1545	1918 2299
1890 146	1909 1602	1919 2325
1900 864	1910 1648	1920 2996
1901 918	1911 1833	1921 3355
1902 944	1912 1345	1922 3587
1903 990	1913 1500	1923 3604
1904 1125	1914 1709	1924 3843
1905 1273	1915 1826	1925 3920
1906 1393	1916 1847	1926 3968
1907 1481	1917 2059	

The decline in Japanese tonnage in the 1912 is not a true condition. In that year Japan declared that foreign built ships could register in Dairen without cost, and the result was that large numbers of Japanese

ships of foreign build registered from that port, giving the appearance of a loss in tonnage to Japan, whereas such was not the case, the registry merely being transferred to Dairen, which Japan controlled.

Japan rivals France in the extent of Government aid to shipping, and the subsidy legislation of Japan has been modeled upon that of France. The results obtained in Japan have, however, been much more satisfactory than those obtained in France. Whether this is due to Government aid is doubtful, since economic conditions were favorable in Japan to a merchant marine development. It is believed that government aid stimulated interest, and made possible the full utilization of the economic conditions.

Prior to 1880 the Japanese shipping consisted largely of junks in coastwise trade. In that year the total tonnage of Japan's foreign built ships was 89,000 tons. There was little increase in this kind of tonnage until the war with China in 1893 and 1894, when Japan was forced to purchase many steamers for use as transports. This event gave Japan's shipping great impetus, and was followed up by the subsidy law of 1896.

The war with Russia in 1903 and 1904 compelled Japan to buy more steamers for transports, and her merchant marine was consequently greatly increased.

A lull in the shipping industry followed the war with Russia. However, her shipping increased steadily thereafter until the World War, when Europeans were forced to abandon trade in the Pacific. This left the field clear for Japan. She took advantage of her opportunity and her merchant marine made tremendous increases. After the war, the race for merchant marine was continued and Japan under liberal subsidies, has been keeping up with her competitors.

Economically, Japan must have a large merchant marine. She must import many necessities of life, including rice, her staple food. She is forced to import 700,000 tons of rice yearly. Japan also must import iron and fuel to carry on war.

GENERAL

It is interesting to note at this time that of the tonnage laid down or appropriated for in the world, Japan is building 4.5%, France 6.5%, the United States 2.6% and Great Britain 59%.

And of the world's merchant shipping, Japan has 6.1%, France has 5.4%, the United States has 19.1%.

In conclusion I would like to quote from a speech by Congressman Nelson Dingley, in the House of Representatives, in 1891. "A

merchant marine and shipyards and trained seamen and skilled shipwrights are essential to commercial independence and national defense. The care of the merchant marine of the nation and the preservation of her shipyards, to which the nation might resort in time of war, for the construction of transports and cruisers are as vitally important as the maintenance of forts and navies."

REFERENCES

JAPAN YEAR BOOK. 1927.
EUROPA YEAR BOOK. 1927.
ALFRED HAAG. In October 1927 issue of *Naval Institute Proceedings.*
GREAT AMERICAN DEBATES. U. S. Congress
JAPANESE EXPANSION AND AMERICAN POLICIES. Abbott
THINGS, JAPANESE. Chamberlain
WORLDS ALMANAC, 1927
BROOKLYN EAGLE ALMANAC, 1927.
COMMANDANT A. THOMAZI, Sept. 1927, issue *Naval Institute Proceeding*
MERCHANT MARINE ACT OF 1920. U. S.
GOVERNMENT AID TO MERCHANT SHIPPING. Grosvenor M. Jones.
TRANSPACIFIC SHIPPING. Commercial Attache Julian Arnold, with a Section on Japanese Shipping by Vice Consul M. D. Kirjassoff.

MAXIM XXXII

The duty of an advanced guard does not consist in advancing or retiring, but in maneuvering. An advanced guard should be composed of light cavalry, supported by a reserve of heavy cavalry, and by battalions of infantry, supported also by artillery. An advanced guard should consist of picked troops, and the general officers, officers, and men should be selected for their respective capabilities and knowledge. A corps deficient in instruction is only an embarrassment to an advanced guard.—Napoleon's **Maxims of War.**

Coast Forts of Colonial New York

THE date of the first visit paid by white men to the shores of the present State of New York is lost in the obscurity of the past. It is alleged that Lief Erickson, a hardy Icelandic sea-captain, found his way into the harbor of New York while on a voyage of exploration from Massachusetts, where he spent the year 1001-1002. In the spring of 1524, Giovanni da Verrazano, a native of Florence sailing under a commission from Francis I. of France, made a voyage of discovery and exploration in the course of which he entered New York Harbor and noted with admiration its spacious anchorage. It is probable that Estevan Gomez, a Portugese pilot, visited Manhattan in 1525; and it is reasonably certain that other mariners entered the bay during the course of the sixteenth century. However, none of these early visits proved to be productive of practical results; and it was not until the re-discovery of the harbor by Henry Hudson that the story of New York begins.

This indefatigable English mariner was obsessed, as were many others, with the idea of finding a short route to Cathay and the Far East by way of a north-eastern or a north-western passage. He had made two unsuccessful voyages for the Muscovy Company of London, when, further support failing him in England, he turned to Holland, then the foremost maritime nation in the world. Here, in 1609, he was employed by the East India Company and was given a fly-boat, the *Half Moon*, in which to make his third voyage. After sailing along the central Atlantic coast for a time, he entered the harbor of New York in September, and, upon sight of the broad waters of the river which now bears his name, he felt that he had succeeded in his mission. He sailed up the river as far as the present site of Albany, where the rapidly shoaling channel convinced him that the river was "at an end for ships to go in." He thereupon put about and returned to Europe.

An account of the voyage and a description of the delightful country he had visited, published in Holland, excited the interest of the Dutch tradesmen to such an extent that other expeditions were sent out; and soon a lucrative trade in furs was developed along the North (Hudson) River. For several years, however, there was no thought of a permanent establishment in the New World, although "before the year 1614, there were one or two little forts built there (on Manhattan Island), and provided with garrisons for the protection of the trade." It is highly improbable that any building was erected prior to 1614

which could be called a fort, although some of the tiny huts put up for the benefit of the traders may have mounted a gun or two. No buildings other than temporary shelters had as yet been built.

As commerce grew in value and in extent, the necessity for a permanent trading-post with resident factor became evident. To encourage such a settlement, the States-General in Holland passed an act in 1614 which gave to a company of merchants of Amsterdam, known as the United New Netherland Company, the exclusive right to trade in the country explored by Hudson. The merchants who were associated in this company had sent a fleet of five trading-vessels to Manhattan Island, where a small fort is said to have been built on the southern end of the island. Mrs. Van Rensslaer says *(History of the City of New York, Vol. I, p. 23)* that the fort at Castle Island near Albany was the first building in the colony of which any record remains and that there is no contemporaneous evidence to support the story that houses had been built on the lower end of Manhattan Island; but Isaac Jogues, writing in 1644, says that Fort Amsterdam was begun in 1615.

Before the end of the year 1614, Hendrick Christiaensen, one of the captains of the fleet and, later, factor for the merchants of Amsterdam, sailed up the Mauritius (North of Hudson) River to Castle Island, which was close to the western shore of the river and within the present limits of the city of Albany. Here he built Fort Nassau, a block-house thirty-six feet long and twenty-six feet wide, inclosed by a stockade fifty-eight feet square and a moat eighteen feet wide. For its defense, Fort Nassau was equipped with two heavy guns and eleven swivel guns or petreros, and was garrisoned by ten or twelve men.

Adriaen Block, another of the captains of the five ships, took his vessel through East River into Long Island Sound, and explored the shores of Long Island and New England as far as Cape Cod and Nahant Bay. In the meantime, Cornelis Jacobsen May, the captain of a small vessel called the *Fortune*, explored to the southward as far as Delaware Bay. Upon these two voyages rested the claim of Holland to the immense stretch of territory which lay between Cape Cod and Cape Henlopen and which received the name of New Netherland.

From the first, Fort Nassau met with adversity. After having been inundated several times by the spring freshets from the upper country, it was almost completely washed away in the spring of 1617, and the site was abandoned. A new post was built two miles further south on an eminence overlooking the river at the mouth of the Tawasentha, a creek which the Dutch named Norman's Kill. This location was found to be inconvenient for trading purposes and the post was, in 1622, removed further north to the present site of Albany. Still on the west

bank of the river, another fort was built, with "four angles," and named Fort Orange. Some time after the completion of this work, the settlers "also placed upon the Prince's Island, formerly called the Murderer's Island, a fort, which was named by them 'Wilhelmus.' "

Finding their trade with the Indians to be exceedingly profitable, the Dutch traders extended their operations to cover the territory from the Connecticut to the Delaware. They traded on the Hudson River, Delaware River, Long Island Sound, Connecticut River, Narragansett Bay, and Buzzard's Bay. Through all this great expanse of territory, the phlegmatic Hollanders maintained, on the whole, friendly relations with the savage residents. They had no competition, notwithstanding the fact that England laid claim to the whole Atlantic seaboard, but competition threatened. The settlement of Jamestown to the south and of Plymouth to the north heralded the ultimate encroachment of the English upon Dutch territory. In preparation for such an event and in encouragement of Dutch emigration to New Netherland, the West India Company was formed and granted a monopoly of trade and of government in the Colony.

Under the auspices of this corporation the establishment of permanent settlements was seriously begun. In 1623, a group of thirty families was sent out under the leadership of Captain May and distributed to Manhattan Island, Fort Orange, House of Good Hope on the Connecticut River, and Fort Nassau on the Delaware "to take possession" for the Company. Captain May, who had accompanied the first arrivals in 1614, became the first Director of New Netherland under the West India Company. He was succeeded the next year by Willem Verhulst, who, in May, 1626, gave way in his turn to Peter Minuit, the first Director-General. Minuit began his administration with the purchase of the twenty-two thousand acres of "the island Manhattes from the savages for the value of sixty guilders."

Having completed the purchase of the island, the Director-General occupied himself with looking to its security. On the southern point of the island, a "large" fort "was staked out by Master Kryn Frederycke, an engineer." This work was little more than a block-house of sodded earthworks "with four angles" and faced with stone "as the walls of earth fall down." It was completely encircled by palisades of red cedar, and, before its completion, it was called Fort Amsterdam, the first of the many names it was destined to bear.

The settlers at Fort Amsterdam were mostly farmers, and they built their first homes outside the fort. It was intended that, upon completion of the defenses, they would all transfer their residences to the fort "so as to garrison it and be secure from sudden attack." With this

purpose in mind, the fort was given a length of about three hundred and fifty feet and a width of about two hundred and fifty feet; but it took so long in the building and the Indians remained so peaceable that none of the colonists, other than the Director-General and some of the governmental officials, ever moved inside. The fort stood upon the site of the Custom House of today, overlooking the reef of rocks which ultimately became the Battery. Its sally-port, covered by a small redoubt, opened toward the north on Bowling Green.

The English claims to New Netherlands, based upon the discoveries of Sebastian Cabot, had never been actively pressed nor had they ever been entirely abandoned. With the spread of the English settlements from the vicinity of Boston and of Jamestown, the Dutch began to feel the pressure, and conflict between the English and the Dutch became imminent. A near-conflict occurred at New Amsterdam in the spring of 1633, when Jacob Eelkins, former commissary at Fort Orange, entered the harbor as supercargo in the English ship *William*. Eelkins, in the interests of his English employers, was determined to participate in the trade of the Hudson, but the vacillating Wouter Van Twiller, who had just succeeded Minuit's successor, Bastiaen Janssen Krol, as Director-General, peremptorily refused his permission. In the face of Eelkin's persistence, Van Twiller ordered the Orange flag hoisted at Fort Amsterdam and a salute of three guns fired. Eelkins replied by displaying the English flag on his ship and firing a similar salute to King Charles. He then weighed anchor and boldly sailed up stream. Van Twiller, in chagrin at seeing his authority thus flouted, promptly "assembled all his forces before his door, had a cask of wine brought out, fllled a bumper, and cried out for those who loved the Prince of Orange and him to do the same as he did," and drank confusion to the English. By that time the *William* was safely beyond the guns of the fort.

The burghers were mortified by the pusillanimous conduct of their Director-General, and that night at dinner the more pugnacious Captain Pietersen de Vries told him: "If it had been my case, I would have helped him from the fort to some eight-pound beans, and prevented him going up the river." Spurred into action by the belligerent advice of De Vries, Van Twiller sent an expedition after Eelkins, and had him brought back and convoyed to sea.

This visit by an English vessel served to focus attention upon the need of a serviceable fort on Manhattan Island. Fort Amsterdam had not as yet been completed, and such portions as had been done had become dilapidated and were sadly in need of repair. During the year 1633, the fort was reconstructed and rehabilitated with earthen

walls, one of the bastions being constructed of stone. The following year, the Company announced that Fort Amsterdam had cost four thousand one hundred and seventy-two guilders. Two year's were required in the reconstruction of the fort; and within its walls were built the Governor's house, a guard-house, and the barracks.

After 1635, Van Twiller neglected his fortifications, as did William Kieft, who became Director-General in 1638. By this time Fort Amsterdam was again well decayed and "open on every side" except "at the stone point"; the guns were dismounted; and all the buildings "required considerable repair." Little or nothing was done. Isaac Jogues, writing in 1644, said: "The fort which is at the point of the island about five or six leagues from its (the harbor's) mouth, is called Fort Amsterdam; it has four regular bastians mounted with several pieces of artillery. All these bastions and the curtains were in 1643 but ramparts of earth, most of which had crumbled away, so that the fort could be entered on all sides. There were no ditches. There were sixty soldiers to garrison the said fort and another (Fort Orange) which they had built further up. . . . They were beginning to face the gates and bastions with stone. . . . The fort was begun in the year 1615." At this time Fort Orange was "a wretched little fort, built of logs, with four or five pieces of cannon of Breteuil, and as many swivels."

Fort Amsterdam was ordered repaired in 1664, but, to save on the costs, the work was to be done "with good clay and firm sods." Such a parsimonious policy, so much in line with the later peacetime policy of the United States, could result only in additional expense, but could not then be avoided because of the state of finances in New Netherland. The repairs were, of course, ineffective, and, nine years later, during the war between England and Holland, the Director-General, that passionate, obstinate, valiant soldier General Peter Stuyvesant, found it necessary to order further rebuilding. Nevertheless, not a great deal was accomplished.

In 1654, Cromwell ordered an expedition of four ships with two hundred English regulars and six hundred New England volunteers to proceed against New Amsterdam. Stuyvesant, full of apprehension, convened his Council and proposed the raising of a loan for the purpose of repairing and garrisoning the fort. He was not unduly hopeful that much would be done, for, characteristically pessimistic, he did not, so he said, expect assistance from "the people residing in the country—not even the Dutch"—in case of an attack. His fears were unfounded, for the Dutch inhabitants, nothwithstanding their grievances against Stuyvesant, labored steadily and heartily upon the fortifications. For an immediate garrison, the city raised sixty men,

and the neighboring towns detailed one-third of their male inhabitants as minute-men. New Amsterdam was soon ready to receive the enemy, but peace between the two countries put an end to the projected expedition before it left Massachusetts Bay.

The English had always looked upon the Hollanders as "intruders" in the New World and continued to advance their claim to the territory occupied by the Dutch. When the break came in 1664, New Amsterdam was unprepared. For ten years the old fort had slumberously and peacefully disintegrated and had become worse than useless. Under the energetic Stuyvesant, the Council and the city authorities recommended that the citadel be completely fortified, and, for that purpose, they raised a loan of nearly thirty thousand guilders.

It was too late, for England had finally determined to take to herself that which she claimed. Holland's hour was struck when the King of England granted to the Duke of York and Albany "all the land from the west side of the Connectecutte River to the east side of De La Ware Bay," and when the Duke, as Lord High Admiral of the Fleet, detached four ships for service against New Amsterdam. In these vessels, the *Guinea,* of thirty-six guns, the *Elias,* of thirty guns, the *Martin,* of sixteen guns, and the *William and Mary,* of ten guns, he embarked four hundred and fifty regular soldiers under Colonel Richard Nicolls, who was to be Deputy-Governor of the to-be acquired territory.

Stuyvesant soon learned of the impending attack and ordered that the city be placed in a state of defense. Little there was that he could do. When, late in August, Nicolls anchored in Nyack (Gravesend) Bay, New Amsterdam was not prepared to withstand an assault. Even so, the fort was one of the best in America at the time but, notwithstanding this, it was inadequate to the occasion. Its walls, "backed by coarse gravel," were not more than four feet thick and in many places not over ten feet high. Within the fort were less than one hundred and fifty soldiers and only a few hundred pounds of powder. There was no water supply inside the fort and provisions were somewhat scanty. The walls were closely encircled by compactly grouped private dwellings which greatly restricted the field of fire and afforded practicable means for scaling the walls. Finally, the fort was commanded within pistol-shot by the hills to the north over which ran the "Heere Weg."

The people refused to be called out for military service at Fort Amsterdam; the troops were beginning to mutter. The city was open on both rivers and was defended on the north by but a simple palisaded breastwork, incapable of withstanding a siege. Fort Amsterdam and the city were indeed untenable, for, as Stuyvesant said, "whosoever by

ship or ships is master on the river will in a short time be master of the fort."

Notwithstanding the helplessness of his situation and despite the pacifistic attitude of the inhabitants, Stuyvesant put on a bold front and, for several days, conducted a paper warfare with the English commander. The correspondence failed to promise any results favorable to the Dutch, so, at last, the unhappy Director-General, influenced rather by the desires of his people than by his own, was forced to yield to the inevitable. Articles of capitulation were prepared, and on the eighth of September, 1664, he marched out of the fort with all the honors of war, leading his soldiers to the water-front whence they embarked for Holland. The English immediately occupied the fort and the city, and the English flag was hoisted over the community. New Netherland became New York, and Fort Amsterdam became Fort James. Fort Orange, peaceably surrendering shortly afterwards, became Fort Albany. After fifty years of possession, Holland had been stripped of her American colony.

Holland, naturally, protested the capture of New Netherland and demanded its return to Dutch control, but England, also naturally, declined to consider the question. As a final outcome of the controversy, war broke out in 1665 between the two countries, and Holland authorized the West India Company "to attack, conquer, and ruin the English everywhere, both in and out of Europe, on land and sea."

Nicolls, well aware of the precariousness of his situation, prepared as well as he might to defend himself. He had "but a ragged sort of a fort, put into the best posture of defence possible, well fitted with cannon, no want of ammunition for the present, and as many soldiers as will not lose his majestie's interest but with their own lives." Fort James, with its low ramparts, greatly needed repairs, but it was felt that raising the walls higher would be of little advantage. "A battery upon the point would be of greater advantage, and more considerable than the fort itself," but the war came to an end in 1667 without having reached New York.

In the summer of 1668, the military establishment of the colony was reorganized. Under the new arrangement, the garrison at Fort Albany was made to consist of a lieutenant, a sergeant, a gunner, a drummer, and twenty men; and Fort James was garrisoned with a lieutenant, an ensign, a surgeon, a marshal, four sergeants, a gunner, four corporals, and eighty men.

In 1669, in a description of New York, John Ogilby, the cosmographer, said: "Upon one side of the town is James'-Fort, capable to lodge three hundred souldiers and Officers: It hath four bastions, forty

pieces of cannon mounted; the walls of stone, lined with a thick rampart of Earth; well accomodated with a spring of fresh water (uncovered by the English themselves), always furnished with arms and ammunition against accidents."

By 1672, relations between England and Holland again became strained, with France, on this occasion, on the side of England. War, declared early in the spring, offered Holland another opportunity to regain her lost New Netherland. Governor Lovelace, who had succeeded Nicolls in 1668, was directed by the King to build another battery and to place the Colony on a war footing. The towns were requested to contribute to the repair of Fort James; and the fortifications were vigorously pushed. A wooden retaining wall along the shore of East River was replaced with a stone wall covered by two half-moon batteries. Albany was directed to take similar defensive precautions.

In the following spring, while Lovelace was absent at Anne Hook's Neck (Hutchinson's Bay), news reached New York that a Dutch squadron was on its way from the West Indies. Summoned to the capital, Lovelace saw no signs of the enemy and decided that the report was "one of Manning's 'larrums." He made no repairs to the fort and he took no special precautionary measures. He did temporarily increase the garrison at Fort James to about three hundred and fifty regulars and volunteers, but he soon again reduced the number to about eighty.

Unfortunately, the information concerning the approaching invasion was only too true. In December, 1672, Cornelis Evertsen had been sent out from Zealand with fifteen ships to the West Indies, where he was joined by Jacob Binckes with four vessels. Turning north, they entered the Chesapeake in July and captured or burned a dozen Virginia tobacco ships. Meeting a sloop from New York below the James River, the Dutch learned of the condition of the defenses of New York and decided to attack that city.

A few days later, the fleet, augmented by prizes and reinforcements to twenty-three vessels, arrived off Staten Island, carrying sixteen hundred men under the command of Captain Anthony Colve. Learning from the Dutch inhabitants how weak the fort really was, the Dutch commanders came up the bay and anchored above the Narrows, in sight of the city.

Governor Lovelace was then absent on a trip to Hartford and New Haven, and the imagination of Captain Manning, in command of the fort, failed to rise above procrastination until the Governor could return. During the preliminary exchange of correspondence, while

the town "was in a strange hurly-burly," the fleet worked up with the tide and anchored within musket-shot of the fort without a gun being fired on either side. Manning asked for delay and was given half an hour. At the end of this time the fleet opened fire upon the fort, killing or wounding a few of the garrison. Playing its part, the fort "fired upon them again, and shot the General's ship through and through."

A witness gives the following account of the capture of New York. "On Monday the 28th. of July, about 3 of the clock in ye after noone, ye Govr. with ye Secretary being then at Hartford with Govr. Winthrop about busines of publicq concerne, six sayle of shipps were seene at Sandhook (a place some 7 leagues from N: York) by the inhabitants of Staten Iland. . . .

"About 11 a clock this same night, . . . there came another boat, with 5 or 6 hands, from Staten Iland to ye Fort, bringing us fresh intelligence of 19 ships in ye Bay of certaine, wch being strongly affirmed, ye bearers alledging to haue seene, and told them almost 19 tymes ouer. Our people were noe less dismayed than amazed, knowing our selues to be but weak in comparison of such a fleet; for without Long Iland assistance wee found wee could not make an 100 men, as indeede afterward it prooved. Moreouer, ye ill condition of ye Fort by ye badnes of ye carrages and platformes, wch. then were not fixt (as twas intended they should be at ye Gouernors returne), together with ye absence of his Honor, did soe much bereave our men of their wonted liuelynes and vigor, that in all that night there was little or noe thing done in way of preparation for an enemy. . . .

"(Tuesday evening) About an hower after seven, . . . wee saw them at length very farely sayle in, one after an other, till wee told 21 sayle, ye last whereof was a sloope; but when they were in, (it growing towards night) they came to an anchor under Staten Iland, where they stayde till ye morrow. . . .

". . . After this (failure of a parley) they began to make their batterings upon ye Fort, or men being charged not to fire first. There upon wee fired upon them & soe continued firing one against another about an houre. At length wee finding their power too great for us, there being nine men of warr against only 6 gunns of ours (whose carriages & platformes were soe bad as wee could not bring them to beare, nor could scarce discharge one gunn twice), wee putt up a flagg of truce upon ye works & beat a parley. Yet notwithstanding they kept firing & landing their men a great while after. Wee seeing their men land soe fast & fearing a storme, . . . order was given (especially when we heard they brought granados to throw among us) that the flagg should be struck. . . .

". . . Thereupon ye Fort gates were opened & they marcht into ye Fort, our men making a guard for them." The flag of the Dutch Republic was once more raised over the fort. New York resumed its former name of New Netherland, while the city became New Orange and Fort James became Fort Willem Hendrick. Fort Albany, which offered no resistance, became Fort Nassau, and the city of Albany took the name of Willemstadt.

The affairs of the metropolis went on with great regularity under the new administration. Measures were taken to improve the fortifications, for the fort was miserably insecure. Its condition, as described by Stuyvesant, had been very little improved by Nicolls or Lovelace, neither of whom seem really to have apprehended an attack by a foreign foe. "Houses, gardens, and orchards" clustered "close under its walls and ramparts," and the fields of fire were greatly obstructed. These obstructions were ordered demolished and the owners were moved. By the end of the year the city fortifications were "on the eve of perfection" at "excessive expense, trouble, and labor of the burghery and inhabitants," and by the following March the city was "capable (under God) of resisting all attacks of any enemies" that might appear.

The conquest of New Netherland, however, came to naught. Holland found herself unable alone to cope with England and France, so she sought an alliance with Spain. To bring that country into the conflict, the Dutch Republic had to agree to a peace with England upon the basis of a mutual restoration of conquests. This was before Holland had learned of the capture of New York, and when the news arrived at Amsterdam, it was too late to recede. The treaty of Westminster was signed, and New Netherland once more became New York.

When rumors of these events reached New Orange, Colve was still engaged in strengthening the city "against the coming of a New England army" which was threatened by Massachusetts, Plymouth, and Connecticut. One hundred and eighty or ninety guns had been mounted on Fort Willem Hendrick and about the town. News of the peace arriving, the Dutch burghers were taunted with having "slaved and wrought too hard and too long for the King of England," whereupon they flew "into such a distracted rage and passion that they cried, 'We'll fire the town, pluck down the fortifications, and tear out the governors' throats' who had compelled them to slave so" to no purpose.

Authentic intelligence of the peace was soon received, and Colve, pursuant to instruction, transferred the province to the new English governor, Major Edmund Andros, upon his arrival in November, 1674.

At Albany, in 1676, Andros built a new stockaded fort, with four bastions and mounting twelve guns, so as to command and defend the

whole town and be "sufficient against Indians." At Fort Willem Hendrick, which again became Fort James under the English, not a great deal was done. Colve had left the fort in excellent condition, but Andros found it necessary to effect some small repairs. According to his own report, he "impregnably fortified" it. Danckaerts, writing this same year, gives us a description of the fort at the time. He says:

"It is not large; it has four points or batteries; it has no moat outside, but is enclosed with a double row of palisades. It is built from the foundation with quarry stone. The parapet is of earth. It is well provided with 46 cannon, for the most part of iron, though there were some small brass pieces, all bearing the mark or arms of the Netherlanders. The garrison is small. There is a well of fine water dug in the fort by the English. . . . The front of the fort stretches east and west, and consequently the sides run north and south." The fort enclosed about two acres of ground.

By 1687, Fort James had again decayed, and most of its guns were dismounted. Governor Dongan says that he had it repaired in almost all its parts, and adds that, "though this fortification be inconsiderable, I could wish that the king had several of them in these parts. . . . At Albany there is a Fort made of Pine Trees fifteen foot high and foot over with Batterys and conveniences made for men to walk about, there are nine guns, small arms for forty men four Barils of Powder with great and small shott in proportion. The Timber and Boards being rotten were renewed this year. In my opinion it were better that Fort were built up of Stone and Lime which will not double the charge of this years repair which yet will not last above six or seven years before it will require the like again whereas on the contrary were it built of Lime and Stone it may be far more easily maintained."

A year later, Fort James was found to be "extraordinarly out of repair." Mayor Van Cortlandt and others reported that even the stone wall of the fort was in no better than "indifferent good condition," while the stockade was gone and the rest of the work almost in ruins. The battery in front of the City Hall had been "mostly washed away by the sea;" guns and carriages were out of repair; and ammunition and stores were lacking. In the following spring, the much-repaired fort was again repaired by Governor Nicholson, who had just arrived.

An argument which occurred at Fort James between Governor Nicholson and Lieutenant Henry Cuyler, in the latter part of May, 1689, concerning the placing of a sentinel in the fort, was so magnified by gossip throughout the town that the governor appeared to have threatened to burn down the town. A popular uprising resulted, and the fort was seized by Captain Jacob Leisler and the troops. The incident

was small in itself, but the people were so much stirred up by events and rumors of events in Europe that they needed but a slight pretext to induce them to turn definitely against the governor.

After Leisler and his adherents took possession of the fort, Nicholson for a time maintained a show of authority, but by the end of June, Leisler had assumed charge of the province. The name of the fort was again changed to William, which it had borne in 1673. Not until March, 1690, did Leisler force the surrender of Fort Albany.

Leisler completed the work on the fortifications, putting the walls and buildings in good condition, and opened up the well, which had been filled in. He renewed and extended the other defenses of the city, and he built a semi-circular redoubt, mounting six guns, "behind the fort on the flat rock to the westward," where it commanded the landings of both rivers and was itself covered by the guns of the fort. Long known as Leisler's Half-Moon, it was the original of the works known in later days as the Battery or the Grand Battery.

After a number of tempestuous months, during which he put the city in "full posture of defence," Leisler was informed of the appointment of Colonel Henry Sloughter as Governor. In January, 1691, Major Richard Ingoldsby, a member of Governor Sloughter's party, arrived at New York with a detachment of troops in advance of the governor and demanded possession of Fort William for the King's forces and their stores. Leisler, "very angry at the demand," refused compliance until Ingoldsby could show his authority to assume command, and, pending the arrival of the governor, he quartered the troops in the City Hall. For additional support in his controversy with Ingoldsby, he brought armed men to the fort from all parts of the province and from New Jersey; and he removed the guns of the fort from the river front to the landward side so that they could be brought to bear upon the city when he found that Ingoldsby "did besiege the fort and planted divers great guns against it."

The dispute culminated on the 17th of March, when Leisler fired one of the guns of the fort at the King's troops as they stood on parade. Following this, shots were fired at the building in which they were billeted, whereby several men were wounded and two were killed. The next day Leisler fired a few more shots which did no harm, while Ingoldsby, with great restraint, refrained from attacking and held his men on the defensive.

At this critical moment, word came that the *Archangel*, with Governor Sloughter aboard, had anchored below the Narrows. The governor hastened to New York and sent Ingoldsby to demand entrance into the fort. Leisler at first refused, but on the following day, March 20,

1691, he surrendered the fort and was cast into prison, later being executed. Sloughter took possession and named this much-named fort William Henry, after the King.

In 1693, the city of New York, under the direction of Governor Fletcher, erected a battery on the point of the island to supplement the fort. This battery was built on the site of or near Leisler's Half-Moon. By 1699, two additional batteries had been erected, one on each side of the Narrows.

At the same time, repairs were effected on the fort, which was, in 1695, "reasonably strong, and well provided with ammunition, having in it about thirty-eight guns. Mounted on the basis likewise, in convenient places, are three batteries of great guns; one of fifteen, called Whitehall Battery, one of five by the Stadthouse, and the third of ten by the Burgher's Path. On the north east angle is a strong blockhouse and half moon, wherein are six or seven guns; this part buts upon the river, and is all along fortified with a sufficient bank of earth. On the north side are two large stone points, and therein about eight guns, some mounted and some unmounted. On the northwest angle is a blockhouse, and on the west side two hornworks which are furnished with some guns, six or seven in number; this side buts upon Hudson's River."

The years began to pass peacefully for Fort William Henry. With English settlements on all sides, every encouragement for decay existed. A moment of excitement arose in 1705 when, "Our harbor being wholly unfortified," a privateer entered the port and frightened the inhabitants. After this small thrill, the old fort settled back into the routine of its humdrum life. As it grew older, however, it retained its habit of frequently changing its name. By 1712, it had become Fort Anne; and in 1734 it took the name of Fort George, a name which it retained until the Revolutionary War. Moderate repairs were effected from time to time, and an occasional battery was built, as in 1735, when George Augustus's Royal Battery was erected on Whitehall Rocks; but little by little the old fort decayed. By 1765, the city was practically without seaward protection.

In the meantime, New York had grown to be a city of importance, from both a commercial and a military point of view. Strategically located with reference to the other colonies, it became the headquarters of the British troops in America, and it was frequently the rendezvous of the naval forces operating in American waters. Following the passage of the stamp act, and in anticipation of opposition to the distribution of the stamps, the fort was strengthened and regarrisoned, ammunition was collected, and guns were mounted. The repeal of the Stamp

Act eased the tension, and no action occurred at Fort George until after the outbreak of the Revolutionary War.

Two fires of consequence are noted during the century. On March 18, 1741, the house in the fort known as the King's House or the Province House, in which the lieutenant governor was living at the time, was discovered to be on fire. It and the other buildings in the fort were all burned and had to be replaced. In 1773, while occupied by Governor Tryon, it was again destroyed by fire.

In 1774, an "Estimate of the Expence of a Fortress on Nutten Island" was carefully made. The estimate called for seventeen thousand five hundred pounds for the erection of a "strong castle, because an enemy might from thence easily bombard the city without being annoyed either by our battery or the Fort." The "strong castle" was not erected nor were any other works undertaken on the island until 1776 when "1000 Continental troops . . . took possession of Governor's Island and began to fortify it. . . . A citadel and outworks were begun."

At the opening of the Revolutionary War, Fort George, together with its outworks, constituted the only protection New York possessed against attack by sea. This fort was a bastioned square, with walls of stone, each eighty feet in length; and within it were the magazines, storehouses and barracks. An extensive stone battery, with merlons of cedar joists, stood just below the fort, on the water's edge, and mounted ninety-one pieces of artillery.

Early in the war, General Charles Lee was sent to New York to prepare its defenses. After several trips of inspection, he decided that it would not be practicable to prepare a complete defense of the city because of the great extent of shore line, which would enable an enemy to land at any number of places and to attack the city both in front and in flank. "What to do with the city," he wrote, "I own, puzzles me. It is so encircled with deep navigable rivers, that whoever commands the sea must command the town." He therefore planned a series of fortifications which would at least partially protect the town and would embarrass the operations of the English. He undertook the construction of works according to his project, and was relieved in the summer of 1776 by General Lord Stirling, who continued the plan.

Horn's Hook and Hallet's Point were early fortified to block the passage at Hell Gate and to insure safe communication between Long Island and New York. The battery at Horn's Hook mounted eight pieces and received the name of Thompson's Battery.

In March, a body of troops occupied Governor's Island and commenced the erection of a redoubt on its western side. The citadel and its

outworks mounted altogether four 32-pounders and four 18-pounders.

On the same night, a detachment occupied Red Hook, the extreme point of land north of Gowanus Bay. Here the troops constructed a redoubt which was named Fort Defiance and which mounted four 18-pounders and one 3-pounder.

In the next place, works to protect East River were projected, and a number of redoubts and batteries were built. Whitehall Battery was a small work on the Whitehall Dock, mounting two 32-pounders. It was practically a continuation of the Grand Battery. Waterbury's Battery was built on the dock at the foot of Catherine Street, where the river was narrowest, and mounted two 12-pounders. To cover the fire of Waterbury's Battery, Bedlam's Redoubt was erected on Rutgers Hill, just above, and was given seven guns, but it appears not to have been occupied later. Coenties Battery was placed in Coenties Slip on Ten Eyck's Wharf. A horseshoe redoubt at Monroe and Rutgers Streets and a star redoubt between Clinton and Montgomery Streets completed the East River defenses on the New York side. One of these last two works was called Spencer's Redoubt and was equipped with two 12-pounders and four field pieces.

On the opposite bank, works were laid out on Columbia Heights, where the guns could sweep the river and also command the city and render it untenable. A redoubt was built on the bluff opposite Coenties Battery and called Fort Stirling. A citadel was begun in rear of Fort Stirling but was never finished. A redoubt, mounting five guns and called Fort Putnam, was built upon a hill overlooking Wallabout Bay. When cleared of its trees, this site commanded East River.

On the North River side, Lee considered that neither Fort George nor the Grand Battery could be held under the concentrated fire of large ships. The river was too wide and too deep to permit consideration of obstructions. Batteries were, however, erected at various points along the shore. McDougall's Battery was situated on the high ground in rear and south of Trinity Church, and was provided with six guns. A little south of McDougall's Battery was Oyster Battery, mounting two 32-pounders and three 12-pounders. A little above, on the line of Reade Street, stood the Jersey Battery, a five-sided work mounting three 32-pounders and two 12-pounders. Further up was the Grenadier Battery, a "beautiful" circular battery situated at the corner of the present Washington and Harrison Streets, mounting two 12-pounders and two mortars. A line of entrenchments connected the Grenadier Battery and the Jersey Battery, and extended beyond them.

At Paulus Hook, on the Jersey shore, works were commenced in

May, and by June three 32-pounders, three 12-pounders, and two 3-pounder field pieces had been mounted.

Hulks of vessels were sunk in the channel between Governor's Island and the Battery, and *cheveaux-de-frise* were formed to oppose the passage of British vessels up East River.

With the close of the campaign around Boston, military activities were transferred to New York. Washington hastened to that city and took charge of the preparations. Early in July, 1776, General Howe landed a force of nine thousand men on Staten Island, where he was joined by Clinton from the unsuccessful siege of Charleston and by Admiral Howe from England. On the 22nd of August, about ten thousand of the British troops were landed on Long Island, where about eight thousand Americans were posted in defense of Brooklyn. On the morning of the 27th, the battle began, and during the night of the 29th the defeated Americans withdrew to New York.

During the battle, Admiral Howe "sent up four ships, which anchored about two miles below Nutten Island, and kept up a tremendous fire against the rebel fortifications there. But the distance was so great it made no impression, did no injury, and might as well have been directed at the moon as at Nutten Island, for all the good it did." One of the smaller ships did manage to beat up the bay far enough so that it was able to injure the breastworks and dismount some of the guns of the inadequate battery at Red Hook.

Following the Battle of Long Island, the British troops occupied all the works on that side of the river. New York city was lost with the loss of Long Island, for, as Washington readily saw, the enemy could easily surround the city. He therefore reluctantly agreed with his Council of War in its determination to abandon the city. In September he removed most of the guns of the defenses and withdrew his troops to the north of New York. The evacuation was successfully made, and the British took possession of the deserted town.

On the 16th of October, Howe embarked his forces, passed into Long Island Sound, and landed in the vicinity of Westchester. Washington faced the British east of Harlem River. On the 28th, a battle was brought on at White Plains. The Americans were driven from their positions; and Washington withdrew to the heights of North Castle.

The American army now occupied both sides of the river. Four thousand men were left at North Castle under General Lee. Fort Washington, on Manhattan Island, was defended by three thousand men under Colonel Magaw. A detachment occupied Fort Lee on the western shore. This fort had been built at the Palisades, about two and a half miles below Kingsbridge, and guarded one end of the line of river

obstructions—four ships chained and boomed and a large *cheveaux-de-frise*—which had been sunk between the two forts.

Fort Washington had been built upon a rocky eminence, difficult of ascent, about a quarter of a mile from the Hudson River. It is described as a "pentagonal, bastioned earthwork, without a keep, having a feeble profile and scarcely any ditch." Although not strong enough to resist heavy artillery, it was considered sufficient to prevent capture by assault. It contained four 32-pounders, two 18-pounders, seven 12-pounders, five 9-pounders, fifteen 6-pounders, eight 3-pounders, and two 5½ inch howitzers.

Half a mile above Fort Washington was Fort Tryon, a two-gun redoubt. It received its name while it was being strengthened after its capture by the British.

Still further north, overlooking the mouth of the Spuyten-Duyvil Creek, was a small two-gun redoubt called Cock Hill Fort. North of Spuyten-Duyvil Creek was a square redoubt, called Fort Number One, overlooking the Hudson and the mouth of the creek. Thrown up in haste by the Americans, it was abandoned by them when attacked by the British before the capture of Fort Washington.

General Howe, realizing that Forts Washington and Lee commanded the river, determined upon their reduction. The obstacles in the river had not been completed when, early in October, the frigates *Phoenix, Roebuck,* and *Tartar,* and three ketches sailed boldly past the forts in a movement preliminary to combined operations on the part of the British. This successful run-by demonstrated the small value of the forts, but the Congress insisted that Fort Washington should not be abandoned except under the direst necessity.

On the 27th of October, two war vessels moved up and anchored off Washington Heights out of the field of fire of Fort Washington. The Americans dragged one of the 18-pounders down from the fort and set it up in a position which would bear upon the ships. In the meantime, Fort Lee kept up an ineffectual fire. The tide, coming upstream, prevented the frigates from weighing anchor, and held them as steady targets for the American gunners. One of the vessels was badly battered before it could be towed out of range by barges from the other ship.

Operations against the American defenses, begun from the landward side, resulted in the capture of Fort Washington by assault on the 15th of November, after all the outlying works had been taken. The British immediately crossed the river and forced the abandonment

of Fort Lee, to which General Greene had been sent after the Battle of Harlem Heights. Fort Washington was renamed Fort Knyphausen by the British, but upon its repossession by the Americans seven years later, it resumed its former name.

Washington took his army into New Jersey, but it was essential that the Hudson Valley line of communications into Canada be kept closed. Consequently the Americans prepared additional defensive works further to the north in the vicinity of West Point. During the winter of 1776 and the following spring, they built three forts designed to prevent the passage of enemy ships up the Hudson. On the eastern side of the river, just north of Peekskill, they erected Fort Independence,, while across the river, almost directly opposite, they constructed Forts Clinton and Montgomery, Fort Clinton being the more southern of the two. At Fort Montgomery a chain was stretched across the river as an obstruction against any attempt by English ships to ascend the river, and two frigates were stationed north of the chain as a protection against attempts to remove it. General Israel Putnam was in general command, with General James Clinton in charge of Forts Clinton and Montgomery.

Early in October, Sir Henry Clinton sent an expedition against the works around West Point. His force consisted of about three thousand men convoyed by a large fleet. By the fifth, the British reached Verplanck's Point, where the Americans had had a defensive work named Fort La Fayette. This fort, directly opposite Stony Point, had been built for the protection of the passage from King's Ferry to the opposite side.

Favored by a fog, Sir Henry made a feint towards Peeksville and caused Putnam to place all his Continental troops on that side of the river and to bring a number of other troops from the opposite side. The British galleys then advanced far enough up the river to interrupt communication between the two bodies of American forces. On the sixth, the main body of the English was landed at Stony Point, on the western shore, and Forts Clinton and Montgomery, open in the rear, were carried by assault. The forts were dismantled, and the boom and chain across the river was broken and removed.

The British fleet then sailed on up the river and proceeded to attack Fort Constitution, which the Americans had constructed on Constitution Island, opposite West Point. Peeksville, Fort Independence, and Fort Constitution were hastily abandoned by the Americans. Fort Constitution was the first of the series of fortifications around West Point and had been erected in 1775-76 at a cost of twenty-five thousand dollars, under the direction of Bernard Romans, an English engineer.

After his successes on the Hudson, Clinton failed to continue his operations to the northward, and shortly afterward withdrew to New York. Following his evacuation, the Americans saw that they must strengthen their defenses at West Point; and Washington directed Putnam to do so. Putnam was, however, transferred to Connecticut, and nothing was done until the arrival of General McDougall in the spring of 1778. Kosciuszko was McDougall's engineer, and was in charge of the erection of all the works in the vicinity.

At West Point, upon a cliff which rises 187 feet above the river, was built the main redoubt. This was a fort of logs and earth, six hundred feet in extent along its interior lines, with walls fourteen feet high and twenty-one thick at the base. Upon its completion in May, it received the name of Fort Clinton.

To support Fort Clinton, works were constructed upon the surrounding hills. On Mount Independence, immediately back of West Point, was built a strong fort which was named Fort Putnam. South of Fort Putnam were two small works called Fort Wyllys and Fort Webb; and on Sugar Loaf was a redoubt named South Battery. Fort Constitution was strengthened; and a huge iron chain was stretched between West Point and Constitution Island.

By the end of 1779 West Point was probably the strongest military post in the country, and was of great value not only because of its strategic location but also because of its large supply of ordnance and stores. The English tried in various ways to acquire the location; and every school-boy is familiar with their attempt and failure to obtain it through the treachery of Benedict Arnold, who had succeeded in having himself appointed to its command.

In the latter part of May, 1779, Clinton sailed with an expedition against Stony Point. The garrison, unable to resist, evacuated the works; and Clinton greatly strengthened it, thereby cutting off communication from West Point to the south. The fort stood on a rock which rose percipitously from the river and which was practically an island at high tide. The work of retaking Stony Point was assigned to General Anthony Wayne. On the 15th of July, under cover of darkness, he assaulted the fort with his men carrying unloaded muskets but with fixed bayonets. The sentries were bound and gagged, the ramparts were scaled, and the garrison was surprised and captured. Wayne then destroyed the fort and its stores, and evacuated the post.

The two sides now continued to maintain their relative positions in this locality until the close of the war. On November 30, 1782, the articles of peace were agreed to; and on November 25, 1783, the Governor of the State of New York and the Commander-in-Chief of the

American Armies took possession of the city of New York. General Knox immediately entered Fort George and prepared to fire an appropriate salute. With this, Fort George closed its career as a colonial coast fort.

So far as its military life was concerned, the fort had not had a glorious career. On the other hand, it had played an important part in the social and administrative life of the community. Long the center and focus of local activities, dwellings of the inhabitants of the city were closely grouped without its walls, while within lived, for the most part, the successive governors and some of the other officials of the Province. A windmill to grind corn for the employees of the West India Company stood close to the fort; a church for the welfare of the community had been built inside the sally-port. Until 1677, the only public well in the town was near the gates of the fort; and to the north, Bowling Green, called the Plain, remained for generations an open space used for drills and maneuvers, for markets, for fairs, and for public gatherings of every description.

As an interesting side-light, we find that the hogs were to a great extent responsible for some of the frequent repairs to the old fort. In the early days the hogs were the only scavengers in the city and were permitted to run at large in the streets. In 1653, Governor Stuyvesant, in a communication to the municipal authorities, noted "with great grief" the damage done to the walls of the fort by the hogs, "especially now again in the spring when the grass comes out;" and he recommended to the city authorities, not that the hogs be restrained, but that the fort be fenced in to "prevent the pigs" from tearing it up.

This fort, which was the first in the Province, was also the last under Provincial or State control. From the beginning of its long life to its very end, this much-named and much-repaired military work continued to cumber the ground, valueless in time of war and useless in time of peace, a source of expense at all times and a means of defense at none.

REFERENCES

Avery, Elroy M. A History of the United States and Its People. Vols. II, III, V, and VI. (Cleveland, 1907-9.)

Bellamy, Blanche W. Governors' Island, published in *Historic New York, Vol. I*, and in *Half Moon Series*, Vol. I, No. 5.

Bolton, Reginald P. The Defence and Reduction of Mount Washington, Manhattan Island, published in the Empire State Society's *Fort Washington*.

Booth, Mary L. History of the City of New York. 2 Volumes. (New York, 1867.)

Brodhead, John R. History of the State of New York. 2 Volumes. (New York, 1853.)

Dunlap, William. History of the New Netherlands, Province of New York, and State of New York. 2 Volumes. (New York, 1839-40.)

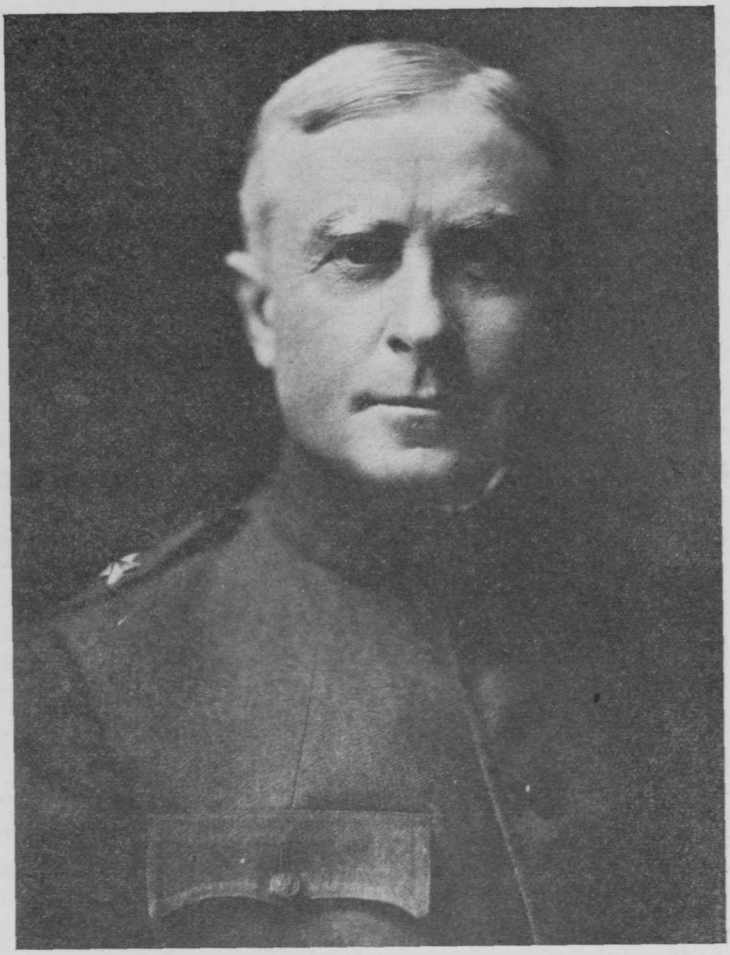
Empire State Society of the Sons of the American Revolution, The. Fort Washington. (New York, 1902.)

Goodwin, Maud W. Fort Amsterdam in the Days of the Dutch, published in *Historic New York*, Vol. I, and in *Half Moon Series*, Vol. I, No. 8.

Goodwin, Maud W., Royce, Alice R., and Putnam, Ruth. HISTORIC NEW YORK. 2 Volumes. (New York, 1897.)
Half Moon Series, Vol. I, Nos. 5 and 8. (New York, 1897.)
Hall, Edward H. FORT WASHINTON AND ITS RELATED FORTIFICATIONS, published in the Empire State Society's *Fort Washington*.
Hammond, John M. QUAINT AND HISTORIC FORTS OF NORTH AMERICA. (Philadelphia, 1915.)
Innes, J. H. NEW AMSTERDAM AND ITS PEOPLE. (New York, 1902.)
James, Bartlett B., and Jameson, J. Franklin. JOURNAL OF JASPER DANCKAERTS, 1679-1680. (New York, 1913.)
Jameson, J. Franklin. NARRATIVES OF NEW NETHERLANDS, 1609-1664.
Jogues, Isaac. A DESCRIPTION OF NEW NETHERLANDS, IN 1664, published in O'Callaghan's *Documentary History of New York*, Vol. IV.
Johnston, Henry P. THE CAMPAIGN OF 1776 AROUND NEW YORK AND BROOKLYN, published as Vol. III of the *Memoirs of the Long Island Historical Society*.
King, Moses. HANDBOOK OF NEW YORK CITY. (Buffalo, 1892.)
Long Island Historical Society. MEMOIRS OF. Vols. I and III. (Brooklyn, 1867-78.)
Massachusetts Historical Society. PROCEEDINGS OF, SECOND SERIES. Vol. IV. (Boston, 1889.)
Massachusetts Historical Society. COLLECTIONS OF, SIXTH SERIES. Vol. III. (Boston, 1889.)
Miller, John. A DESCRIPTION OF THE PROVINCE AND CITY OF NEW YORK (1695). (Reprint, New York, 1862.)
New York Historical Society. COLLECTIONS OF, FOR THE YEAR 1875. (New York, 1876.)
New York Historical Society. COLLECTIONS OF, FOR THE YEAR 1877. (New York, 1878.)
New York Historical Society. COLLECTIONS OF, Vols. IV and V. (New York, 1829-30.)
O'Callaghan, Edmund B. THE DOCUMENTARY HISTORY OF THE STATE OF NEW YORK. 4 Volumes. (Albany, 1850-51.)
O'Callaghan, Edmund B. HISTORY OF NEW NETHERLAND. 2 Volumes. (New York, 1855.)
Ridpath, John C. HISTORY OF THE WORLD, Vol. III. (New York, 1897.)
Schilders, J. JOURNAL OF OUR VOYAGE TO NEW NETHERLAND, published in Vol. I of the *Memoirs of the Long Island Historical Society*.
Smith, William. HISTORY OF NEW YORK. (Albany, 1814).
Steele, Matthew P. AMERICAN CAMPAIGNS. Vol. I. (Washington, 1909.)
Stiles, Henry R. A HISTORY OF THE CITY OF BROOKLYN. Vol. 1. (Brooklyn, 1867.)
Valentine, David T. HISTORY OF THE CITY OF NEW YORK. (New York, 1853.)
Van Rensslaer, Mariana S. HISTORY OF THE CITY OF NEW YORK IN THE SEVENTEENTH CENTURY. 2 Volumes. (New York, 1909.)
Wilson, James G. THE MEMORIAL HISTORY OF THE CITY OF NEW YORK. 4 Volumes. (New York, 1892-93.)

MAXIM XXIV

Never lose sight of this maxim, that you should establish your cantonments at the most distant and best protected point from the enemy, especially where a surprise is possible. By this means you will have time to unite all your forces before he can attack you.—Napoleon's Maxims of War.



COLONEL RICHMOND P. DAVIS

Commandant Coast Artillery School, April 28, 1921—December 28, 1922

EDITORIAL

Mechanization

THROUGHOUT military circles the world over there is a strong trend toward mechanization of armies. The movement started prior to the World War, in a small way, with the introduction of motor transportation and was progressing but slowly when war broke out. Stabilization in France created a demand for greater offensive and defensive powers, for increased protection for personnel and materiel, for higher speed in supply and transportation, and for increased radii of vision, which, in turn, led to the development or improvement of tanks, aircraft, motor transportation, radio, heavy mobile artillery, narrow gauge railway, and weapons of various kinds. Wherever practicable, machines were used to replace men and animals.

The impetus toward mechanization given by the war suffered a set-back in the lean years immediately following the war, but never entirely died. The possibility of further utilization of machinery in war remained in military minds, and was brought to light when interest in things military began to revive.

France, with an abiding faith in the foot-soldier, has probably progressed less toward mechanization than the other Powers. Germany is keenly interested but has been handicapped by the terms of the Versailles treaty. The United States, never particularly interested in military affairs in time of peace, has been making moderate progress and is undertaking tests that may lead to further development. Great Britain, at the present time, is deeply interested in all phases of mechanization and is far in the lead in the mechanical development of its army.

The British visualize a battle of the future as one between tanks on the ground and aircraft in the air. Armies march at the rate of twenty, thirty, fifty miles an hour, a land battle developing more rapidly than one at sea, without, however, equal visibility. Out in front during the intial stages are the reconnaissance groups of high-speed tankettes; (it is reported that the one-man tank has not proved to be a success in cross-country work under service conditions) behind these come the combat patrols of light tanks; and in rear follows the main body of heavy tanks, each carrying its own light artillery. Lines

of communication are lengthened, and supply columns must be given speeds considerably greater than now obtain. Command difficulties are greatly increased, and the position of the commander remains to be determined. Battle, once joined, will be decided quickly, but whether the defeated army can be annihilated is as yet an open argument.

If the British conception be correct, the problems introduced into warfare are many and complicated, but probably none is greater than that of the service of heavy artillery. It is conceivable that the bulk of the light artillery can be carried on the heavy tanks, but these fighting weapons will need supplemental protection fully as much as did the front lines of World War days, particularly when it comes to holding vantage points gained or when the tanks for any other reason lose mobility. Neither the railway gun nor the tractor gun of today will serve, for neither is sufficiently mobile, and it is not probable that either, as now designed, can be given the requisite mobility. Even if the British conception greatly exceed probabilities, the fact remains that mechanization is upon us and that heavy artillery must be made increasingly mobile.

The design of guns, carriages, and motive power is not a function of the Coast Artillery, but their use is distinctly a Coast Artillery function and that branch should be prepared at all times to indicate the characteristics of heavy artillery which will best serve on the field of battle. We must therefore keep an attentive eye upon developments in other armies and in other branches of our own Army that we may be ready to call for the equipment we need to keep our place in the movement toward mechanization.

Subscription Agents

Readers are again reminded that the JOURNAL does not employ subscription agents nor does it pay commissions on subscriptions through agencies. Subscriptions placed with any of the established agencies will be promptly forwarded to us and entered, but care should be exercised in dealing with solicitors, particularly if they press the point of subscribing to the JOURNAL.

PROFESSIONAL NOTES

Harbor Defenses of New Bedford

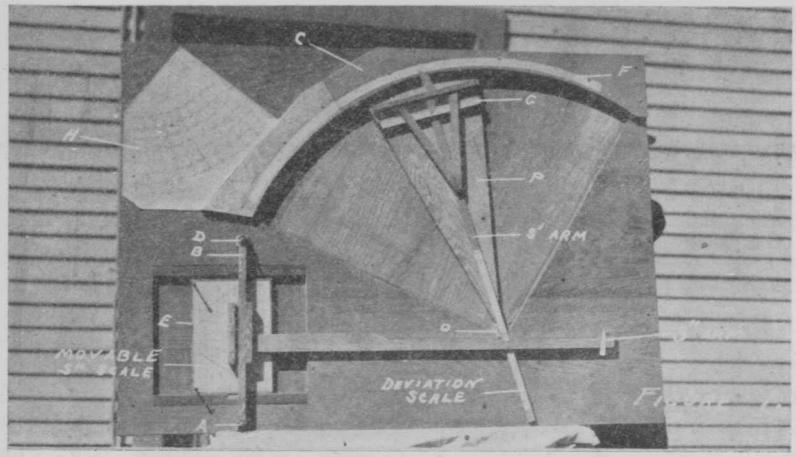
The Coat of Arms for the Harbor Defenses of New Bedford bears on a *Shield: Gules*, an arm embowed brandishing a harpoon proper.

The City of New Bedford from its earliest days was known as the "Whaling City," which accounts for the arm and harpoon on the shield.

A Spotting Board

By Lieut. John I. Hincke, 3rd C. A. (H. D.)

Coast Artillery Memorandum No. 7 states that the function of spotting is equally important to that of plotting, while in the same paragraph it also states that until a standard spotting system can be adopted, resort must be had to the

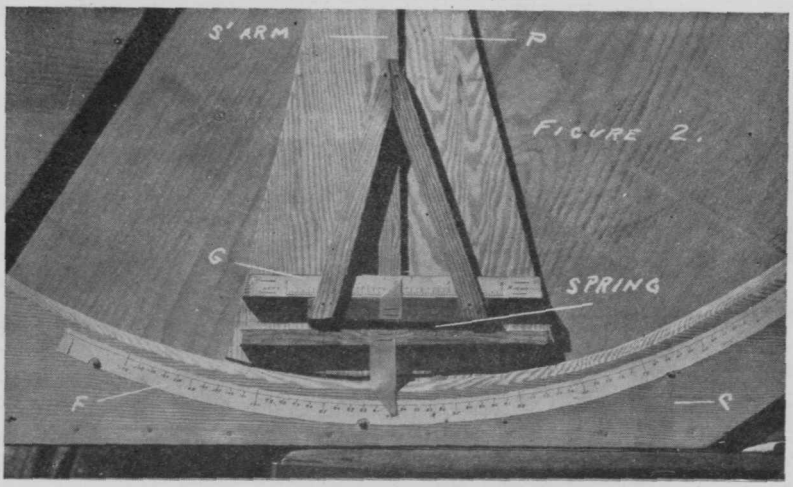


utilization of locally made spotting boards. The following discussion describes how a spotting board can be made and operated that will be fast and accurate, will be easy to operate, will require only two men therefor, and will compute the deviations in terms of percentage of range to the target. This last feature is useful when it is used in connection with the impact board, and is also an advantage in any other method of adjustment in that the battery commander can make his corrections and apply them directly in terms of per cent. Also, the board is universal and will read deviations from the center of the danger space.

It is necessary to have two observers, S′ and S″, at positions where they can see the field of fire, the S′ observer being at or near the directing point of the battery. For the board described herein the S″ station must be to the right of S′, but if it is more convenient to have it to the left, it is only necessary to invert the construction of the board, placing the S″ arm to the left of the S′ arm. The

observers are connected by telephone direct to the S′ and S″ operators of the board and send them the angular deviations of the splash from the target in hundredths of degrees right or left, as observed from their stations.

Description and Construction.—The board (Fig. 1) is made of well seasoned, one-inch lumber, securely fastened and braced beneath, and its outside dimensions are 3 x 4 feet. It has two arms, the S′ and S″ arms, each made to slide perpendicularly to their lengths in spring-held slides as shown in Figs. 2 and 3. The S′ slide is on the platen P. The platen has its face flush with the face of the board, and is held in position by the collar C and the pivot O about which it can be rotated. The pivot is a close fitting bolt, to prevent play, and there is also a spring between the platen and the collar C. The S″ arm slides on the bar B, held in place by the thumb bolts A and D. Beneath the slide is the movable S″ scale which is fastened on the movable board E and slides perpendicularly to the S″ slide. Board E is also held snugly in place by a spring (Fig. 3). It is



important that the S′ and S″ arms be fastened securely to their slides so as to allow for no play. The S′ arm moves over the face of the board. It is one-quarter inch thick. The S″ arm is fastened to its slide one-quarter inch above the face of the board, and moves over the S′ arm.

On the collar C there is a degree scale F with index on the platen, which indicates the angle made by the intersection of the two arms at any setting of the platen. On the S′ slide is a longitudinal scale G, with zero in its center, graduated to two degrees both right and left, 1.75 inches equalling one degree. The zero is so placed that when the S′ arm is set at zero, its right edge passes over the center of the pivot O.

The movable S″ scale (Fig. 3) consists of horizontal lines one-half inch apart, numbered from 5 to 15, and intersected by sloping lines as shown in the figure. The center (this one vertical) line is the zero line. To the right and left of the zero line the other sloping lines intersect the horizontal lines at points which lay off distances right and left of the zero line, depending on which sloping and which horizontal line is being used. These distances represent angular deviations right and left from S″ which, on horizontal line No. 10 only, are the same

distances as those on the fixed scale of the S′ slide. On horizontal line No. 5 the distances are half what they are on line No. 10, and so on, the scales on the other horizontal lines bearing the same ratio to the No. 10 scale as its number bears to 10. This is apparent because the sloping lines are straight. The space between each sloping line represents 0.10 degree, each half-degree line is drawn heavier, and each whole degree line still heavier.

The S″ slide has an index which, when set over the zero vertical line of the movable scale will cause the left edge of the S″ arm to pass directly over the center of the pivot O. As shown in Fig. 5, the left half of the S″ arm is here

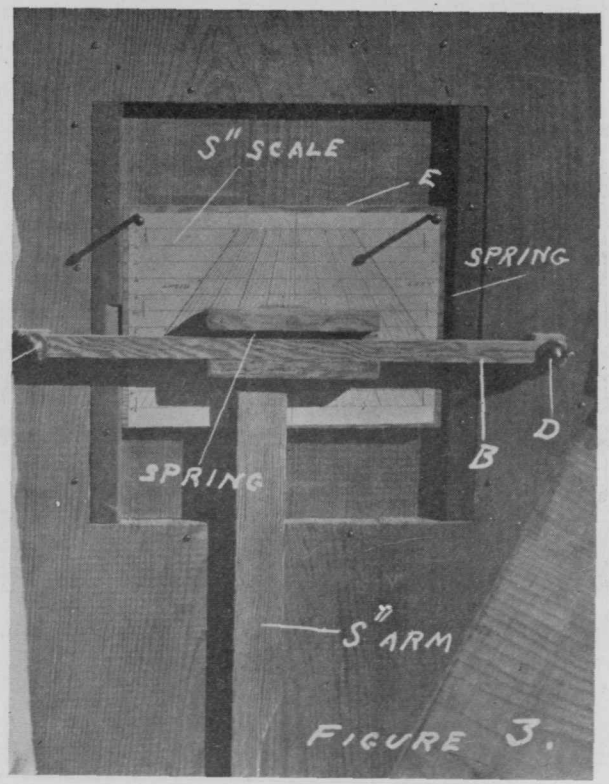


FIGURE 3.

cut away and is replaced by a strip of celluloid on which is a straight black line representing the left edge of the S″ arm. On the S′ arm there is a longitudinal scale graduated in inches and tenths of inches, each inch representing over or short one per cent from the zero, which is in the middle and represents the center of the danger space. The scale is placed so the zero is over the pivot O if the center of the danger space is at the target. Otherwise, the scale is moved accordingly.

Somewhere on the board is the chart H (Fig. 4) representing the field of fire. This chart contains arcs and radii drawn from a fixed point representing the battery. The arcs indicate ranges 1000 yards apart, and the radii are azimuths

five degrees apart. These lines divide the field of fire into blocks, each of which contains two reference numbers, one black and the other red. These numbers are determined as follows: Depending upon the position of the target the lines of sight from S′ and S″ to the target intersect at a definite angle. Also, the arc at the target subtended by one degree from S″, will bear a fixed ratio to a similar arc from S′. This ratio is also dependant upon the position of the target and is equal to the ratio of the ranges of the target from S″ over S′. Now suppose the target to be in a particular block on chart H. The angle between the two lines of sight mentioned above is indicated by the black reference number

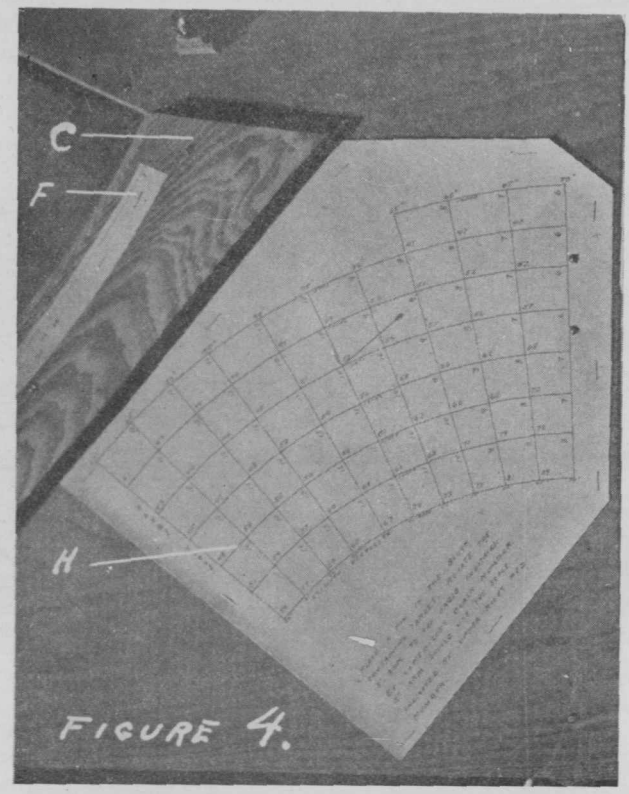


FIGURE 4.

in that block, and the ratio of the arcs mentioned is indicated by the red reference number. The red number 10 indicates a ratio of unity; the number 5 indicates a ratio of 0.5, and so on for other ratios. In making this chart these numbers can either be computed or scaled graphically for each block from a Hatch spotting chart for the field of fire.

The remaining details for the construction of the board can be taken from the figures attached hereto.

Explanation and Operation.—Assume that our board is set up and ready for operation, two operators, the S′ and S″ arm setters, being at their posts and wearing headsets connected respectively with the observers at the S′ and S″ observing stations. Before and during the firing the S′ arm setter listens to the

track of the target as called off from the plotting board and locates the particular block in which it is, marking same with a pin. He then moves the platen till the angle indicated by the black reference number is set on scale F. Likewise, the S″ arm setter moves the movable S″ scale until the horizontal line falling under the S″ arm index is the one indicated by the red reference number. The size of the blocks on chart H is small enough for the reference numbers to apply for any position of the target in the block; also, they are large enough to obviate the necessity of having to reset the platen and S″ scale oftener than once every few minutes. During the firing this can be done in a few seconds between splashes, if the target should move into another block.

Now assume that the board is set for a particular position of the target. When a splash occurs, its angular deviations from the target as observed from the S′ and S″ observing stations are reported to the respective arm setters and set on the arms. The S′ operator then reads the longitudinal deviation over or short,

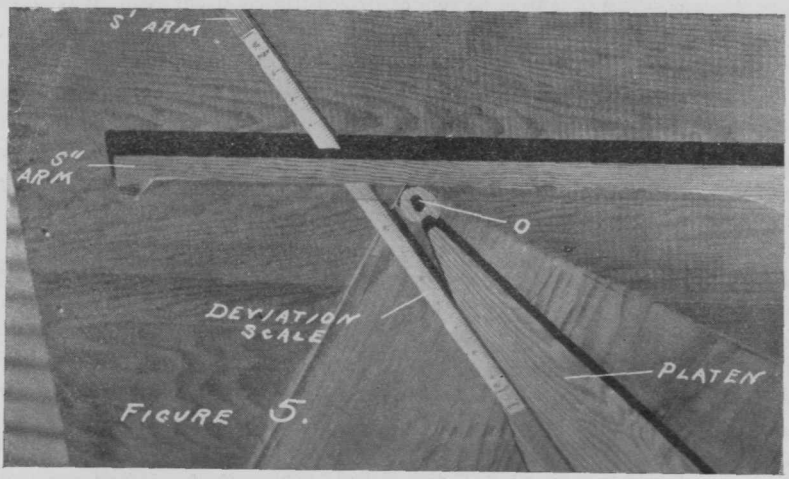


FIGURE 5.

on the S′ arm, as indicated by the intersection of the black line on the celluloid of the S″ arm with the scale on the right edge of the S′ arm (Fig. 5). This deviation will be in terms of percentage of the range of the target from S′, or the battery. The entire operation from the time the splash occurs until the deviation is reported is a matter of about seven seconds.

Let us consider how we know this deviation to be in terms of percentage, and correct. One degree at S′ always subtends at the target, 1.75 per cent of the range to the target. Hence, if the deviation scale on the S′ arm is made for one inch equaling one per cent, one degree on the S′ slide scale will equal 1.75 inches. Now, the arc subtended at the target by one degree from S″ bears no relation to the range of the target from S′. However, it does bear a fixed ratio to the arc subtended by a similar angle from S′ for any particular position of the target. This is what is previously computed and indicated on the chart H by the red reference numbers. For instance, if the arc of one degree from S″ is 1.5 times the size of the arc of one degree from S′, this number will be 15,

and the operator of the S″ arm will set line 15 under his index. The one degree graduations used will then be a length of 1.5 times 1.75 inches, or 2.625 inches. We therefore have our S″ arm moving right or left the proper amount on a scale proportionate to the scale of the S′ slide. There remains only to have the proper angle set between the arms. This is done by moving the platen with the aid of the black reference numbers, as previously described. Therefore, with the proper angle set, the pivot will represent the target and the two arms will represent the lines of sight from S′ and S″ to the splash, actually moved right or left to the proper angular deviation expressed in degrees, but mechanically moved in terms of per cent of range. It follows that the intersection will represent the splash and the distance measured along the S′ arm from the intersection to the zero will represent the longitudinal deviation of the splash in terms of per cent, regardless of what the actual range is. The error introduced by moving the arms to positions parallel to their zero positions is negligible.

Remarks.—This board can be very easily constructed at any post. It requires only some lumber, besides the necessary bolts, screws, and nails. A spring from a salvaged alarm clock will make very good springs for the four slides.

The criticism arises that the board will warp, causing the slides to stick and the data to become inaccurate. However, the springs in the slides will prevent their sticking, and will always insure a snug fit. In case possible expansion or shrinkage of the wood causes the data to be untrue the board can very readily be adjusted by loosening the thumb bolts A and D and slipping the guide bar B, thereby slipping the S″ arm. For this purpose the holes for the thumb bolts are made slightly larger than the bolts. Also, the scales on the S′ arm and S″ slide are not pasted but merely pinned in position, and are readjustable. A sure test for the accuracy and adjustment of the board is made by setting both arms to zero, after which the longitudinal deviation should read zero for all positions of the platen. Besides this, deviations can be computed trigonometrically for certain settings of the board, and the board will be found to check very closely if all parts are in adjustment.

As previously stated, this spotting system requires only four men to operate, two observers and two arm setters, and a deviation can be reported in about seven seconds after the splash. Because of the size of the scales, settings can be quickly made, with small chance of error. Also, with a chart H previously made for each position of the S″ station over all fields of fire, the board is universal. In this respect it is more adaptable to fixed seacoast defenses, however.

The object of a fire-control instrument is to compute data quickly, quietly, and accurately, at the same time relieving its operators of everything but the easiest mental work. It is sometimes the case that simplicity in construction is gained only by overburdening the operators, causing their mental work to be too crowded and complex with the result that it breaks down under the strain of service practice, to say nothing of actual combat. This spotting board, although requiring preliminary computations in the construction of the charts H, reduces to a minimum the actual work of operation during service firing, while also increasing the accuracy of spotting and lessening the chance for error.

An Irish Free State Army List

A graduation list of the officers of the Irish Free State Army has been published for the first time since that Army came into existence. It shows that there are 828 officers on the active list—a great decline since those days when Mr. Bretherton suggested that the Free State Government should erect a statue to the Unknown Private. The mass of general officers of various categories has now vanished. There is only one Lieutenant-General (acting), Daniel Hogan. There are five Major-Generals, senior among them being "Mick" Brennan, of Limerick fame. The Colonels are 25, the Majors 19, the Commandants 88, and the Captains 278. The rest are subalterns. Many of these officers have higher acting rank. There are, for instance, 243 Lieutenants (acting Captains). As the strength of the Irish Free State Army is about 6000, the proportion of officers now borne on the establishment is not excessive, especially when one remembers that many officers have claims for past services which make their employment desirable. The Free State Army is advancing in efficiency and the general mass of officers is making a careful study of the art of war. It may be noted that in these later days Irish Free State officers wear swords—an idea derided in the earlier days. The importance of appearance has been realized, and the obsolescent is employed for its improvement.—*The Army, Navy and Air Force Gazette.*

Joint Review and Exhibition by 243d C. A. (HD) and 211th C. A. (AA)

The Cranston Street Armory, Providence, Rhode Island, was on Monday evening, March 12, 1928, the scene of a joint review tendered His Excellency, Norman S. Case, Governor of Rhode Island, by the 243rd Coast Artillery (HD) and the 211th regiment of Coast Artillery (AA), otherwise known as the First Corps of Cadets, of Boston, Massachusetts.

The drill shed was filled to capacity. It is estimated that approximately 5000 people witnessed the spectacle, while two or three hundred persons were of necessity denied admittance.

Guests of the evening included members of the Rhode Island Legislature; The Adjutant General, Quartermaster General and U. S. Property and Disbursing Officer of Rhode Island; the Commanding Officer and officers of the 10th Coast Artillery, stationed at Fort Adams; the Adjutant, 1st Coast Artillery District, at Boston; the Commanding Officer, officers, and men of the 211th Coast Artillery (AA), of Boston; members of the State Staff Corps and Departments; members of the 43rd Division Staff; officers of the 241st Coast Artillery, of Boston; active and retired officers of the various branches of service of the Rhode Island National Guard; many Reserve Corps officers and their friends.

Promptly at eight o'clock the evening's program was opened with a half-hour concert by the 243rd Coast Artillery (HD) band.

Battery "C" had scarcely left the drill shed floor after its exhibition of calesthenics, when "call to arms" was sounded. It was the signal for the portrayal of the "Defense of a Fort." The great doors of the drill shed swung wide, and in rolled the 75-mm. A.A. guns and the 36-inch A. A. searchlight units, followed by a battery of machine guns. Wires were laid, communications established, the enemy (in the form of an electrically propelled silhouette of a battleship, and a miniature hand propelled airplane) located, and firing begun. The dummy 10-inch

gun and 12-inch mortar concentrated fire on the battleship, primers being used to simulate actual gunfire. The fixed searchlight functioned well in keeping the target illuminated. During the night phase of the engagement the A. A. lights were active in searching the uppermost recesses of the drill shed for the enemy plane. Once located, a scorching fire (with blank ammunition) was laid down by the machine guns, until at a given signal the plane was disabled and crashed to the floor. The illusion was so great as to produce gasps from some of the spectators. Casualties were given first aid treatment and were moved to the rear on litters by the Medical Department Detachment. The roar of the big guns intermingled with the sputtering machine guns, with the resultant smoke, lent the necessary "color" to make the picture a realistic one. Recall, denoting the end of this exhibition was sounded at 9:10 p. m. The excellence of the performance, and the smart precision with which the drill floor was cleared, was proclaimed by the plaudits of the spectators.

The joint review of the two regiments was preceded by a retreat parade given by the 2nd Battalion, 243rd Coast Artillery (HD).

An exhibition drill by a composite unit of the 211th Coast Artillery (AA) followed the parade, and immediately preceded the review. The drill team, dressed in the white and blue uniforms of the First Corps of Cadets, presented a striking appearance, and executed the varied movements of their drill in a manner deserving of much praise.

During the review of troops which followed, trophies won by units and individuals of the 243rd Coast Artillery (HD) during the past year, together with State service medals, were presented by His Excellency, Governor Case.

The 243rd Coast Artillery (HD) is commanded by Colonel Cyril L. D. Wells; the 211th Coast Artillery (AA) by Lt. Colonel Horace Z. Landon.

Army Stagnation

An expressive service phrase "the world war hump," explains in four words exactly why promotion in the army has been slow ever since 1918. The commissioned strength of the army on December 31, 1927, was:

Major-Generals	22
Brigadier-Generals	46
Colonels	531
Lieutenant-Colonels	660
Majors	2172
Captains	4142
First Lieutenants	2772
Second Lieutenants	1464
Total	11,809

Any one merely vaguely familiar with organization can see what is wrong with this table. It is a pyramid with too narrow a base and with a bad bulge half way up. That bulge is "the world war bump," made up of some 5600 officers who have nearly the same length of service. There are two hundred and ninety field artillery Captains and more than a thousand infantry Captains, for instance, all with rank from July 1, 1920.—*New York Sun.*

Americanizing the Army

Machinery is being introduced into the army. Tanks, armored cars, trucks, tractors, cross-country vehicles and other mechanical weapons and conveyances are being experimented with and put into use.

The process is commonly called mechanization. The word, therefore, tends to spread a false conception. A better term would be merely modernization. Or it would be fair to say that the army is being Americanized.

* * * * *

Carried to its logical conclusion, the new movement in the war department means that the whole tactical system must be revised. In the modern war of machinery, infantry, as such, will be used only to occupy positions captured by machine or to advance over country impassable to machinery. The long, thin line of prone infrantrymen will pass into history. In modern warfare it is nothing short of absurd for deployed lines of infantry to lie on the military crests of hills, there to be blasted to bits by enemy artillery as the Russian moujiks were in 1915, or to march up to pillbox machine gun nests as the English Tommies did in 1917.

Even slow moving tanks cannot be hit, except by luck, by indirect artillery fire. Machines, capable of traveling cross country and thereby able to avoid mapped roads and cross roads, could advance, carrying guns or squads of infantry until they came within point blank range of the enemy. Indirect fire would not be deadly enough to stop them. If armored against machine gun fire and reasonably protected from the fire of trench weapons like the 37-mm. gun, such machines could advance until within the direct fire of cannon.

Americans have made machinery a means of saving men in industrial life. They can do exactly the same thing in war. Our present endeavor must be to encourage the new spirit that pervades the general staff, to keep the forward looking soldiers in control and relegate the military ancestor worshipers to the clerical positions they can adequately fill.—*Chicago Tribune.*

Motor as a National Defense

In view of American predominance in automotive manufacture, and the employment in this country of 78 per cent of the licensed automobiles in the world, announcement by the War Department that the general staff of the army has been studying mechanization of combat units as a means of making a modern army more mobile and less vulnerable on the field will be received by motor-minded America with particular interest. Mobility of large units of fighting forces has always been of importance in the military history of the world, ancient and modern. And, as the art of war advances, the prompt and rapid movement of troops becomes more important. The value of this factor was shown many times in the world war, when surprise attack in force and prompt response by the defenders of a given point proved of worth above all other considerations.

American arms learned much of the value of the motor during the war in France; learned by observation while America was on the side lines as an observer and more after this country had thrown its unrestrained efforts in with the allies. As onlookers we witnessed the saving of Paris through the service of the motor car when taxicabs, motorbusses, private automobiles and every possible means of transport hurried French soldiers forward to plug the gap that threatened to open before a drive upon the capital. As later participants we moved our men and

equipment and supplies in great motors. Speed was the needed thing, and the automobile and the motor truck supplied the need.

But motorization of military forces had only a small beginning in the fighting in Europe. Great strides have been made in the application of this power since the peace of 1918. Troops and guns have taken to this means of transportation in growing numbers. The ultimate, however, has not been approached. So the general staff has taken the matter up for study.

With 95 per cent of the 23,253,882 automobiles in use in the United States of domestic manufacture and that number representing more than three-fourths of the motor cars in use in the world, it may be seen that both in the manufacture and in the use of this means of transportation this country occupies a commanding position. Nor is the position of the general staff in its desire to make the fighting forces of the country more mobile through application of the motor weakened in any way by the fact that a country leading the world so easily in use of motors is no less a leader in motor-mindedness.—*St. Louis Globe Democrat.*

War Fundamentalists

The general staff of the war department has reported to Secretary Davis that the most serious consideration should be given to the possibility of greatly increasing the striking power and mobility and effectiveness of the army by the mechanization of certain units of the nation's present military force. This report represents the general staff's conclusions after six months of investigation. Though the infantry is still the backbone of land forces, the general staff is convinced that advances in motorization in the last few years have made possible and advisable the restoration to battlefields through mechanization of the element of movement and surprise which before the World War was operative through cavalry.

This report appears to be merely a reasonable recognition of the fact that we are living in a machine age. That war should be mechanized and motorized seems only natural. At any rate, it is sensible for the army to be forehanded in this direction while the governments of the world maintain their present attitude toward war and armament.—*Buffalo Express.*

The Romans as Military Road Builders

The *Militär-Wochenblatt* of January 18, 1928, contains an article by Lieut. Colonel D. Heubes, German army, retired, describing roads built by the ancient Romans, a translation of which is here given:

The Romans were the first people in Europe who recognized the value of good roads for state purposes and who thereby came into possession of a means of power that rendered them great service especially in war times. We still have in Germany, on the Rhine, the Main, and the Danube, numerous remnants of the old Roman highways which are used even today as public roads. But the skill with which they were originally constructed is not generally known and appreciated. Before going into the details of their construction I will explain the system upon which all highways and their connections were laid out throughout the whole ancient Roman empire.

The expression, "all roads lead to Rome," is generally known and is frequently made use of today. It owes its origin to the Roman roadway system according to which all roads emerged originally from the golden mile post set up in the center of the city of Rome and from which they extended and penetrated to all

parts of the empire. After the end of the Samnite wars, Rome began to connect the newly-conquered regions with the capital by means of military roads and established fortified colonies along them. By these the occupation and possession of new lands was not only secured but they were made bases of operations for the conquest of new provinces. There resulted from this an excellent network of means of communication extending to and penetrating the outermost sections of the empire. These roads were completely intermeshed and each thread gave the shortest path to the capital. The needs of commercial traffic and trade were not given the slightest consideration in laying out the main lines; military expediency only was the guide. Building up commercial trade routes and combining or attaching them to the military roads system was given over to the population of the countries inhabiting the regions through which the military roads ran, but these trade routes were also kept under the supervision of the military authorities to the extent of preventing any of them to be laid out and built in any way detrimental to the military purposes of the main systems. The trade roads so built were materially different in manner of construction from those built for military purposes. In descriptions which follow we confine ourselves to Roman state roads which were extended, during several centuries, through German lands. In this we would point out especially the very solid methods of construction as well as the enormous achievements incident thereto. The total construction for the empire involves some 75,000 kilometers of roadways.

All great main lines of state roads were built on the basis of embankments as foundations wherever the terrain made this possible. These embankments were sloped on top to each side from the center line with a drop of about 10 centimeters; the embankments were, on level ground, 2 meters high, and 4 meters over valleys. The width of the top surface was about 5½ meters . . . approximately 18 feet. There were ditches on each side of the embankment for carrying off rain water. These ditches were not placed directly alongside of the embankments but were separated from them by a step from ¼ to ½ meter wide. These bermes or benches, which were somewhat similar to the bermes in our rifle pits that served as arm supports when firing, were occupied in attacks from either side of the roadway for which one had always to be prepared. They provided a favorable place and good cover for defence with oversight from the top of the road embankment. Since the earth taken from excavations from both sides of the road was also used as a breastwork, the road furnished, in addition to its advantage as a permanent means of communication, a valuable defensive position from a military point of view.

The embankment was the initial foundation structure. Further construction proceeded as follows: Thick stones were first rammed into the earth of the embankment in a separate layer and secured to each other with mortar. Upon this was placed a layer of flat stones which were also secured to the lower layer and to each other with mortar and upon them was placed a layer of flint stone pebbles like concrete, laid in cement or mortar. But even this was not enough. On top of the pebble layer was placed another forming the crown of the roadway which was composed of a strong mixture of lime and broken burnt clay tiles that were so beaten down that loosening them now, after one and one half milleniums, requires the use of sharp pickaxes. Cut stones were employed to hold up the sides of the several layers of the embankment which were laid with much care.

Then only came the real top surface of the roadway upon which the troops marched. It consisted of two kinds, plastered or paved surface, *viae stratae*, or

of causeways, *viae glareatae*. The first had an underlayer of regularly worked four-sided quadrants or plates of hard stones which were jointed together with great skill and had a smooth upper surface. Materials used varied with local facilities. Stones deemed most suitable were taken from adjacent localities. On the Alps, for example, one finds the old Roman roads built with stone blocks with a smooth upper surface and carefully jointed together that must have been very laborious and time exhausting. With the *viae glareatae* the upper layer consisted largely of a tightly-stamped-in mortared pebbles with a narrow foot path in the middle with a specially smoothed surface. In places one finds such foot paths on each side of the roadway raised somewhat above the surface and provided with cuts to let the water pass through.

Special conditions, bogs, marshes, and swamps, for example, that had to be crossed, required unusual methods of road construction, as we find them today deeply submerged in the moors. There they built corduroyed foundations with tree stems six to eight meters long, of oak and beech logs smoothly surfaced and divested of all branches on the upper side but with branches left on the under side and thrust for anchorage deep into the mud. A layer of flat stones was laid over these.

We frequently find also that in places the land was leveled to a width of twenty-five paces on one or even on both sides of the road to permit columns of troops to march in extended front. Right of way was not expensive in those days.

A peculiar characteristic of Roman road construction is the fact that they always built on straight lines between two given points, contrary to the methods of other nations who conformed their road lines to the terrain. High hills and rocks were broken through, hills cut through with deep defiles, low places were crossed with very high embankments, valleys and gorges were overcome with skillfully constructed arches whose boldness of outline and construction attracts our surprise and admiration today. The straight-line stretches cut down the distances and reduced the times of marches over them.

Only a militarily trained people like the Romans were capable of achieving tasks demanding the exercise of such tremendous forces.—G. R.

MAXIM XXVI

It is contrary to all true principle to make corps, which have no communication with each other, act separately against a central force whose communications are cut off.—*Napoleon's* Maxims of War.

COAST ARTILLERY BOARD NOTES

Communications relating to the development or improvement in methods or materiel for the Coast Artillery will be welcome from any member of the Corps or of the Service at large. These communications, with models or drawings of devices proposed, may be sent direct to the Coast Artillery Board, Fort Monroe, Virginia, and will receive careful consideration. W. E. COLE, *Colonel, Coast Artillery Corps, President, Coast Artillery Board.*

New Projects Received and Initiated

Project No. 611, Test of Code Practice Equipment.—In accordance with the recommendations of the Signal Corps Technical Committee, the Signal Corps has completed the first stage of the development of Code Practice Equipment. This equipment is intended to facilitate instruction in code practice classes, and especially the simulation of radio net operation. It does not include the use of undulators or ediphones, although provision has been made for any suitable means of automatic sending. One switchboard Type BD-57, complete with keys and headsets, has been received by the Coast Artillery Board. This equipment has been issued to the Radio Course, Department of Enlisted Specialists, for service test under the supervision of the Coast Artillery Board.

Project No. 612, Drawing Instruments (Type for issue to C. A. Organizations).—Recent procurement studies have established the fact that, based on the present authorized issues, manufacture of the instruments, drawing, office set, will not meet requirements under the mobilization plan. In order to overcome this shortage two courses are open, *i. e.*, to reduce the number of sets authorized for issue or to issue a smaller and less expensive set to units which do not need such a complete set as now issued. The Coast Artillery Board has been furnished such a smaller set for consideration in regard to replacing the instruments, drawing, office set, with this smaller set in such units of the Coast Artillery as may be considered advisable. This project is now under consideration by the Coast Artillery Board.

Project No. 613, Revision of Circular No. 21 (Basic Allowances of Equipment for Railway Artillery).—The Coast Artillery Board has from time to time during the past five years studied and reported upon practically all of the important features of railway artillery equipment. These studies and recommendations have not been assembled in such a way as to show in consolidated form the complete equipment of a battery, including the cars required to transport and house it. Furthermore, a complete tabulation of all of the necessary equipment for a firing battery cannot be made at the present time as three important questions have not been definitely settled. A standard type of kitchen car, with its necessary equipment and installations must be adopted. The determination of the power needs of railway units has not been studied in sufficient detail to enable the Board to decide whether an additional car will be needed for this purpose. The allowance of track tools and track maintenance equipment must be changed. These subjects

are now being studied by the Board; when definite conclusions have been reached, a revision of the table of basic allowances will be submitted by the Board.

Project No. 614, "Hincke" Spotting Board.—Lieutenant John I. Hincke, Third Coast Artillery, Fort MacArthur, California, has submitted to the Coast Artillery Board a description of the construction and operation of a spotting board for Coast Artillery. It is claimed for this spotting board that it is as fast and accurate as any board yet developed; easier to operate; requires but two men for operation, and computes the deviations in terms of per cent of range to the target. It is also claimed for this board that it is universal, and will read deviations from the center of the danger space. The Coast Artillery Board will construct a "Hincke" Spotting Board and subject it to service test.

Project No. 615, Comments on Target Practice Reports, 1928.—Target practice reports of all organizations firing are transmitted by the Chief of Coast Artillery to the Coast Artillery Board for study and comment.

Project No. 616, Modification of 3-inch Antiaircraft Carriage, Model 1917.—It is proposed to modify the 1917 antiaircraft guns on fixed mounts to facilitate traversing and elevating and so as to permit loading at the higher elevations. Spur gears will be substituted for the worm gears, and on those guns permitting the same, the trunnions will be raised ten inches.

MAXIM XXXVIII

It is difficult to prevent an enemy supplied with pontoons from crossing a river. When the object of an army which defends the passage is to cover a siege, the moment the general has ascertained his inability to oppose the passage, he should take measures to arrive before the enemy, at an intermediate position between the river he defends and the place he desires to cover.—*Napoleon's* Maxims of War.

BOOK REVIEWS

The Immediate Origins of the War. By Pierre Renouvin, Yale University Press. 1928. 6"x 9¼". 395 pp. $4.00.

A detailed and very thorough study of the period, June 28—August 4, 1914. One cannot expect real impartiality on this subject from a French professor, but to a very marked degree he does maintain a detached attitude of clear-cut historical analysis and his presentation of that great European drama holds one spell bound. The story rolls along, with its intense and conflicting forces, like a Greek tragedy. The actors struggle more and more to escape as their fate closes in about them. At last, in swift climax, comes the inevitable end.

One of the amazing side lights of the story concerns Turkey. Ten days before war was declared "Turkey came forward and offered herself (to the Germans) as an ally." But the German Ambassador in Constantinople reported to Berlin that "Turkey is today still worthless as an ally," and he "proceeded to oppose all idea of such an alliance among the Turks themselves." On the margin of his report the Kaiser wrote "Rot!" and immediately ordered him to reverse his attitude!

Incidentally, except for a few characteristic outbursts, the Kaiser would appear to have had pretty sound views throughout the crisis. On his return from Norway he outlined a plan by which Austria might have had satisfaction from Serbia without bringing on a European war, and later he had no illusions about British intervention at a time when his Ambassador in London thought Great Britain might remain neutral.

On the much mooted point of the effect of British indecision on Germany, Professor Renouvin clears the British Foreign Office of responsibility. "On the evening of the 30th July and the morning of the 31st, at the very moment when she (Germany) sent her double ultimatum to France and Russia, she had every reason to think that England *would* intervene. And *that* is the hour when Germany made her vital decision."

In all that immense and intricate conflict of wills there were two sets of *dominant* aims, the political and the military. They were—

1. *Political.*

Austria-Hungary. To settle, once and for all, with Serbia—to crush her—because "the Dual Monarchy was hovering on the very brink of disintegration, and the national aspirations of the South Slavs together with the Pan-Serbian propaganda were nothing less than a menace to the existence of the Empire—only one among many, perhaps, but still the most serious."

Russia. To defend the sovereignty and national integrity of Serbia, because the Serbs were Slavs and also because of Russian prestige in the Balkans and in Europe, which had already suffered at Austrian hands in 1908 and 1912.

Germany. To support Austria-Hungary, because of "Austria's weakness—in her own interest, she felt the necessity of buoying up her ally."

France. To support Russia, because without Russia she had no security from Germany.

Great Britain. To prevent war, knowing that she would probably be drawn into it, and to retain her freedom of action as long as possible.

2. *Military.*

Austria-Hungary. To finish with Serbia quickly, before pressure from Russia became too great.

Russia, Germany, France. To mobilize at the earliest possible moment—Russia because her mobilization was slow; Germany, because she was committed to the plan of defeating France before turning on Russia; France, because she had to face the powerful German army.

Great Britain. To be prepared at sea for a sudden attack by Germany.

In the earlier stages of the crisis only the dominant political aims controlled. As the climax approached, the military aims were put forward in each country with more and more pressing insistence, and in their turn increased the ever-growing tension. But throughout the crisis no one of the five Great Powers receded to any appreciable extent from its dominant political aim; and it was this conflict of unyielding and irreconcilable political wills, and not the pressure of the general staffs for mobilization, that made war inevitable. "The military provocation of July, 1914, was determined by a diplomatic provocation. The connecting link between them was furnished by the Austrian declaration of war upon Serbia. Now, Germany and Austria were *alone* in desiring this provocation. . . . That is the one fact which dominates all others."—S. M.

Reputations Ten Years After. By Captain B. H. Liddell Hart. Little, Brown and Co. 1928. 5¾"x 8¼". 316 pp. Ill. $3.00.

Excellent short biographies of Joffe, Falkenhayn, Gallieni, Haig, Foch, Ludendorff, Pétain, Allenby, Liggett, and Pershing. Captain Hart's books are always well written, and when he is telling a straight-away story without an eye to some special theory which he is trying to prove, he is at his best.

Joffre he calls "the modern Delphic Oracle." "And thus was the pit dug for the downfall of Plan XVII, and almost of France, by the hands of Joffre, guided by the minds of his entourage." "The man who unquestionably saved France (Lanrezac) was dismissed at the end of the retreat, for his presumption." Joffre's "passivity, like his silence, was carried to such a pitch that he was one of the greatest of human enigmas. This was an inestimable asset in a world where the myth of the 'strong silent man' had not yet been exploded. Reluctant to believe that a man in so great a position could be as simple as he appeared, that his superhuman calm could come from insensibility, his silence from ignorance, even the Allied leaders who met him at close quarters felt that there must be unplumbed depths in the apparent shallows." "Joffre was not a general, but a national nerve sedative."

Gallieni, he thinks, was everything Joffre was not. and "the real victor of the Marne." "For not only did Gallieni afford the one instance of 'Napoleonic coup d'oeil' witnessed on the Western Front in 1914-18, but his intuition, his boldness of manoeuvre, and his swift decision were so vivid a contrast to that of the other leaders, French, British, and German, as to suggest that it was possible to snatch a decision by manoeuvre from the jaws of trench warfare, before the artisan swallowed the artist." "Gallieni—la tête haute."

Falkenhayn he calls "the extravagance of prudence." "No man in all history has controlled such vast forces, and on his qualities and limitations, more than on those of any other man, turned the issue of the greatest of all wars." He was

"always an adherent of the strategy of attrition." "(His) strategy was history's latest example of the folly of half measures." "Colonel Bauer, the one fixture in the headquarters of the Supreme Command throughout the war, has said of Falkenhayn that he possessed nearly every gift of nature 'except the intuition of a commander; his decisions were half measures, and he wavered even over those.'" "He was the ablest and most scientific general, 'penny wise and pound foolish,' who ever ruined his country by refusal to take calculated risks."

Ludendorff he rates much higher. To him, much more than to Hindenburg, is due the credit for Tannenburg. And, he thinks, the Lodz manoeuvre "will live as a classic example of how a small force, by using its mobility to strike at a vital point, can paralyze a vastly larger army." Later he says that "there are few more remarkable feats in the history of war than the use Ludendorff made in 1917, between July and October, of his slender general reserve of six divisions—first, to dislocate Russia's last offensive, next in the coup against Riga, and then at Caporetto." In the last phase of the war, 1918, he thinks that Ludendorff's "wealth of tactical invention is evidence of his breadth of mind and receptiveness," but that "he failed in following tactical success—the line of least resistance—at the expense of the strategical goal. . . . He had neither his former clearness as to the goal, nor quite the same grip on the changing situation." "Most of the leaders (of the World War) were swept up by the machine and carried hopelessly away, but Ludendorff mastered it for long enough to impress a Napoleonic stamp on the otherwise incoherent process of mechanical slaughter politely termed 'attrition'. On Ludendorff the verdict of history may well be that he was the Robot Napoleon."

Haig "was the distilled essence of Britain. . . . Marvelously apt was his family motto, 'Tyde what may.'" He had "obstinacy in adhering to fixed plans without regard to facts. . . . He was a better staff officer than a commander, lacking strategic intuition and the instinct of surprise." But "he maintained a spirit of helpfulness (towards his allies) when in supreme command, and none had a better grasp of the vital importance of cooperation between the Allies," and "it is beyond question that no man has shown or maintained greater self-control in the face of the storms of criticism and the undercurrents of intrigue." The first tanks "were literally pawned for a song of illusory triumph over a local success. . . . Haig reported so dubiously upon them, and in letters expressed so low an opinion of their value, that Sir William Robertson, the Chief of the Imperial General Staff at home, hastened to cancel the programme of construction, and was only prevented by political intervention." "As an executive commander there has hardly been a finer defensive general (than Haig); in contrast, among those who have earned fame as offensive generals none perhaps have made worse errors. . . . His mind was dominated by the instinct of method, a valuable asset; where he failed was in the instinct of surprise in its widest sense—originality of conception, fertility of resource, receptivity to ideas."

In contrast to Haig stands Allenby. "As early as the Boer War Allenby had shown an almost unique instinct for surprise and mobility, which the strange conditions of siege-warfare only dampened but could not extinguish; they flickered into flame before Arras." And in his final campaign in Palestine "the plan, like the execution, was distinguished by its fulfillment of and extreme emphasis upon the principles of mobility and surprise, both strategic and tactical, which have ever been the hall mark of the Great Captains."

Foch he calls "the symbol of the victorious will." "Always a deep rather than a clear thinker, his philosophical treatment of war tended to become mystical as he became more senior, and he spoke in parables which often took days for his officers to fathom. . . . Weygand had the power to translate Foch's mystical phrases into practical and clear directions, and was a born organizer, whereas Foch was a natural disorganizer—indeed, he seems to many not to have understood the needs and principles of either organization or training." But "he showed the elasticity to profit by experience, and by the end of the war had so widened his horizon that it is difficult to estimate how high he might rank among the Great Captains if the war had continued into 1919."

Pétain is summed up as a "military economist." "He was a profound psychologist." "As a commander he has been reproached for excessive caution. It would be more true to say that he was excessively careful—of lives." "The verdict of history on Pétain is likely to read: 'The man who, like Fabius, saved his country by avoiding battle, and who, like Carnot, was the organizer of victory.'"

Liggett is called " a professor of war—and human nature." "Liggett had preserved himself from stagnation (of troop duty and slow promotion) by his interest in reading and in human nature." "Single-minded and high-minded, giving and receiving trust, he was a pattern of the traditional military virtues."

The book ends with "Black Jack" Pershing, the "100-per-cent American." "The quickness with which his mind expanded to the scale of the World War was a greater miracle than the war expansion of America. . . . If he gave his subordinates shorter shift than in the armies of the Allies, he also gave them a freer hand while they held their posts. If this method led to mistakes, it also sifted the grain from the chaff in quick time. Moreover, he had a real knack in picking his men and a catholicity of selection unusual in the professional soldier." On the question of the formation of the American armies, Hart says: "Pershing had human nature on his side, in claiming that American troops should be under American command." But Hart does not altogether agree with Pershing's insistence on the rifle and open warfare. He calls it "inspired by the right idea, but based on false premises," and thinks that "it was fortunate for Pershing that he had to face the Germans of 1918, not of 1914." "The ultimate verdict on his strategy, as on his training doctrine, must be that it was more idealistic than realistic." "As for his achievement, it is sufficient to say that there was perhaps no other man who would or could have built the structure of the American army on the scale he planned. And without that army the war could hardly have been saved and could not have been won."—S. M.

Psychology and the Soldier. By F. C. Bartlett. The Macmillan Co., New York. 1928. 4¾"x 7¼". 224 pp.

This is a brief, general, and rather theoretical treatment of an important military problem by an eminent English psychologist.

The first part of the book deals with the selection, assignment, and training of the recruit. "It is easy to argue that the work of the private soldier does not demand a high degree of intelligence, but there is in practice a minimum of intelligence below which it is dangerous to fall." About six hundred different training courses are now in progress in the British Army, and the wastefulness of attempting to train recruits for work for which they are unfit is emphasized. In this connection, he comments upon the use of psychological tests in our service

while organizing the National Army. Recruits are classified as "visualisers," "vocalisers," and "kinaesthetic" types; it is suggested that the first learn most readily by seeing things done, the second by hearing them explained, and the third by actually doing them under supervision.

Leadership, discipline, and morale are considered next. Leadership may be exercised by rank alone, as represented by the "institutional type" of officer, punctilious, formal, aloof, unadaptable, and a worshipper of precedent. The "dominant type" officer is mentally active, hungry for responsibility and authority, and not afraid of blundering. The "persuasive type" "expresses the group rather than impresses it," and depends upon a constant and intimate touch with his men and his own quickness of wit. An interesting conclusion is that "A man who is much concerned with questions of justice to everybody is in practice inevitably vacillating and timid . . . (and) . . . in a very miserable state. This is what often earns the good disciplinarian an unmerited reputation for lack of sympathy. Once his decision is taken, he treats the affair as closed so far as he is concerned. Only if he has this capacity can he retain the respect of his followers and, for himself, maintain authority without an intolerable strain."

"Civilization may be characterized as an immense conspiracy to make things safe," to avoid discomfort, fatigue, and pain; hence, in war, an abnormal strain is placed upon little-exercised activities. The normal mental reactions to war are successively exhilaration, depression, strain, and finally "a half-ironical, half-serious permanent attitude" of resolution. Certain less normal reactions are also discussed, but battle psychology, as affecting leadership, is not considered.

This book is easy and interesting reading, but too abstract in its treatment to be of material value to the line officer.—F. M. G.

Record Flights. By Clarence D. Chamberlin. Dorrance and Company, Philadelphia. 1928. 5¼″x 8″. 286 pp. Ill. $2.50.

This interesting book has not been given quite the best of titles. A trifle over half of the text is devoted to the flight of the *Columbia*, in which the author piloted Mr. Levine to Germany, and the remainder is autobiographical.

Mr. Chamberlin has been engaged steadily in the flying game ever since he took it up during the World War. He received his early training in the Army and was on his way to France when the Armistice was signed. After being discharged from the Army, he remained in aviation, supporting himself during those lean years by barnstorming, rebuilding planes, buying and selling, and anything else that came along, so long as it belonged to aviation. He acquired a reputation as being a trifle reckless in his flying, a reputation which was probably not altogether justified, for, after ten years he is still flying and he has never made a descent by parachute.

Mr. Chamberlin's big chance came when Mr. Levine proposed to send the Columbia on the hop to Europe. His relations with the designer of the plane were such that Mr. Bellanca was disposed to insist on him as passenger or pilot, but Mr. Levine was strongly opposed to the idea, probably because of the flyer's reputation. In the meantime, Chamberlin was flying the *Columbia*—testing and conditioning it, while Levine hired and fired pilots and navigators. In the end, Chamberlin went as pilot and Levine as passenger.

Throughout the book one is impressed with the author's apparent modesty—a characteristic shared by most great flyers. He says: "Everywhere I go people

ask me how I had the courage to fly across the Atlantic, and my answer is that it doesn't take much courage. For the first fifteen or twenty hours it is easy; anybody could do it. After that all you have to do is look down at the water under you and remember that it's just as far back as it is ahead. Going on is no trick at all then."

"Another idea prevalent with the public is that the pilots who make these long flights are a breed apart, a small and select group of super-airmen. To any extent that I can I wish to explode this fallacy . . . America has a thousand airmen capable of a non-stop flight from New York to Europe if the opportunity, the equipment and the patience and ability to plan and prepare had been theirs. After all, it is only a matter of thorough preparation and a little special training in navigation and in flying by instruments, through thick weather. That, a plane and motor capable of doing the job, a fair amount of 'horse sense' and a little luck are all any good pilot needs to accomplish such a flight."

C. B. Allen, aviation reporter of the *New York World*, collaborated in the preparation of the book. "Of the work, however," Mr. Chamberlin says, "I claim the lion's share—I did the roarin' and he did the 'ritin'!" The "roarin'" was to good purpose.

Masters of War. By Neville D'Esterre. George Allen and Unwin, Ltd. 1928. 5¼"x 7¾". 277 pp. 8*s.* 6*d.*

An essay of 95 pages, not at all flattering to the military profession. The two main theses are that men of genius may become masters of war without military schooling—*e. g.*, Frederick (*sic*), Clive, and Cromwell—and that masters of war of the professional type have not usually been great men—*e. g.*, Marlborough, Napoleon, Wellington, Lee (because he joined the South instead of the North!) and Grant. But the author admits that there is nothing to be done about this, except to abolish war.

Mr. D'Esterre quotes at some length and with evident relish from Thackeray's *Book of Snobs*—and the feeling grows, as one reads D'Esterre's essay, that Thackeray's collection was not quite complete.—S. M.

Aerial Photographs. By 1st Lieutenant Dache M. Reeves, Air Corps, U. S. Army. The Ronald Press Co., New York. 1927. 5¾"x 8½". 312 pp. Ill. $5.00.

The value of the "bird's eye view" of the situation has long been appreciated, yet it took some time after the application of aeronautics to military operations before aerial photography became of common usage. It was the urgent need for information regarding the lay of the land denied to the view of the terrestrial observer that gave this new type of photography its first impulse. Hence we find that the subject became of such importance to the military leader that during four days of the Meuse-Argonne offensive, 56,000 prints were prepared and delivered to the various American units engaged.

Since those days the technique of aerial photography has made such rapid strides that nowadays, with the modern camera equipped with a roll of film capable of containing 100 exposures, the effect of atmospheric haze has largely been overcome and good pictures can be obtained during a large portion of daylight.

The author of this volume, one-time instructor in aerial photography, Air Corps Advanced Flying School, has seen fit to divide his work into two parts: first, a discussion of the characteristics of aerial photography, and then their appli-

cation to the military art. The first part gives the reader detailed instructions in the correct manner of examining aerial photographs. For instance, we are told that the best way to study a photograph is to examine each point as we go along instead of taking the picture as a whole. Thus, with the aid of a vertical photograph, an oblique of the same area, and a reliable map, we have everything necessary to the formation of accurate conception of the lay of the land. The oblique gives us the perspective and an accurate idea of relief, but in so doing necessarily distorts the scale. This is corrected by the vertical, which is true to scale. The picture is then completed by a study of the map, which furnishes place-names, elevations, and contours not given on the photograph. Maps on the other hand are liable to be incomplete and out of date as regards the works of man accomplished since the survey and here again we can correct our map and bring it up to date with the information furnished from the photograph.

As regards the size of any particular object under examination, we know that all detail on a photograph appears to scale instead of being exaggerated as when represented on a map by means of conventional signs hence the dimensions of an object may be secured with accurate results by direct measurement on the photograph. There will usually be included on any photograph a number of objects whose sizes are uniform and these may be used as a reference scale. Examples of the latter are roads of some uniform width, railroad rights-of-way, intervals between telegraph poles, etc. On the other hand there are oftentimes objects on an aerial photograph whose shapes do not furnish an indication of their character and in this case we have to rely on a study of the shadow cast by the object. The study of shadow is particularly important when it is desired to know the height of a given object. Knowing that for a given time of day that the length of the shadow cast by the object is directly proportional to its height, the rest is easy.

The study of the recognition of the various natural features is next taken up and illustrative examples are furnished in great detail. There follows a profusely illustrated chapter devoted to the study of works and structures. The plates are excellent and quite sufficient to convey the meaning of the text.

In discussing the portion of the work devoted to the military application of aerial photographs it is proposed to give a condensed table showing some of the uses to which photographs may be put in assisting the soldier in his many sided endeavors. For example, the infantryman can:

Ascertain the condition of the ground surface over which he is to advance.
Secure detailed information of streams, ravines, and natural barriers.
Study the available natural cover.
Visualize the nature of the enemy strong points.

The artilleryman can:

Study the route of march.
Select firing positions.
Calibrate his guns.
Determine the effectiveness of his fire.

We can go on indefinitely and we find that each arm and auxiliary branch can learn something essential to its efficient operation by a systematic and intelligent study of an aerial photograph.

Lieutenant Reeves has furnished us with a painstaking, accurate, and highly readable study that will prove an asset to any military library.—A. M. J.

Automobile Blue Book. Vol. IV. Automobile Blue Books, Inc., New York. 1927-28. 7"x 9½". 202 pp. Ill. Maps. $1.00.

This volume covers the territory south from Richmond-Louisville to northern Florida and from the Mississippi to the Atlantic. The former plan of issuing four volumes has been abandoned in favor of nine volumes, each covering a smaller section, and the former price of $3.00 per volume has been dropped to $1.00.

The format has also been changed, the size increased, and the covers are now of leatherette board. The section covered by a volume is arbitrarily divided into numbered sections as shown by a key map on the front end-papers, and each of these sections is enlarged to a full page map which is accompanied by smaller city maps, and by pages of information on the towns, points of interest, etc., of that section.

A very complete index gives location of every town in the section covered, and the condition of each road is shown by the map. The omission of the detailed road information which was given in former issues of the blue book may fail to please some of the users, though it is believed that practically all of this information may be obtained from the maps with comparative ease.—W. R. S.

Whitehead's Auction Bridge for Beginners. By Wilbur C. Whitehead. Frederick A. Stokes Company, New York. 1928. 4½"x 6". 120 pp. $1.00.

Thousands of would-be players of auction bridge will welcome this little manual from the pen of a master of the game. The author is among the two or three best known writers on auction bridge, but most of his work, like that of the others, has been too advanced for the real beginner. The maze of detailed knowledge required of the really good player is too intricate for the beginner, who is tempted to lose heart before he has fairly begun the game.

This book for beginners will therefore fill a gap which has heretofore existed in bridge literature. It reduces the game to fundamentals, with a minimum number of rules to be remembered. As the more important part of the game—and the weakest part in the game of the novice—bidding is stressed, receiving nearly twice the space devoted to the play. The book is clear and concise, and its use will enable the beginner to handle his cards intelligently and to lay a solid foundation for further development.

Safari. By Martin Johnson. G. P. Putnam's Sons. New York. 1928. 6¼"x 9¼". 294 pp. Ill. $5.00.

Eighteen years ago Martin Johnson started on his adventuring around the world. His path led through many strange places and brought him, in the end, to Africa, which he now calls home. For the past four years he and his wife, with 200 natives, have lived on the shores of Lake Paradise, in the crater of an extinct volcano five hundred miles from civilization. "Wild elephants come right up and steal sweet potatoes out of our back yard at the Lake. Silly ostriches dash madly across the trail when we are motoring. Rhinos tree us. Lions roar and hyenas cackle around our camp." Yet it is a life the Johnsons love.

Mr. Johnson's occupation is the photography—still and motion—of wild animal life, and his book is an account of his life and surroundings for the past four years, while he was securing some of the finest and most intimate motion pictures of big game ever recorded. Sixty-six fine examples of his work illustrate the text.

The story is dramatic, but not dramatically written. The author is too accustomed to wild animals to be other than matter-of-fact about them. Time after time his life depended upon the actions of the members of his company, particularly upon those of Mrs. Johnson. Fortunately, she is an expert rifle shot and on numerous occasions she brought down at Mr. Johnson's feet wild animals that charged him while he busily cranked the camera. His reliance upon her skill enabled him to secure pictures of a character which otherwise would certainly have been unobtainable.

The sub-title of the book is "A Saga of the African Blue." It is well chosen.

Egypt. By George Young. Charles Scribner's Sons. 1927. 5½"x 8½". 352 pp. $5.00.

Egypt is one volume of the series of national histories known collectively as "The Modern World," nine volumes having been published to date, with five more yet to be completed. Each volume is a complete history in itself, and presents the particular nation with which it deals as that nation exists today, after having experienced the political, economic, and intellectual upheaval of the past ten years.

Mr. George Young, the author of *Egypt,* is an Englishman who has a wide knowledge of conditions in the near East and has attracted much attention by his seven-volume treatise on Ottoman law. One would gather from reading his book on Egypt that Mr. Young has more faith in the ability of the Egyptian to work out his own salvation, politically, than the average Englishman has; and he considers Egypt the "most enigmatical and elusive of all the new nations that have emerged out of the Napoleonic wars."

Mr. Young reminds us that since the decline of the Pharaohs Egypt has been governed by alien conquerors: first, by the Arabs, then for five centuries by the Mamelukes, who were in turn conquered by the Turks. In 1798 Napoleon conquered Egypt and the French ruled there until 1801, when the English under General Abercrombie defeated the French at the Battle of Canopus and restored Egypt to Turkey. Then began a period of turmoil and intrigue which ended in Mehemet Ali making himself ruler of Egypt by clearing the foreigners out and carrying on the government quite independently of the Ottoman Empire, of which Egypt was still nominally a province. Mehemet Ali is credited with having Europeanized Egypt, but Mr. Young considers that Modern Egypt dates from the Napoleonic wars. After Mehemet Ali came members of his family who ruled more or less successfully but plunged Egypt so deeply into debt that in 1876 a foreign receivership was appointed. Meanwhile, the Nationalist Party of Egypt had been gaining in strength and was constantly out-maneuvering the European diplomats. England finally became so exasperated at some particularly clever trickery that she occupied Egypt after a short, sharp campaign. A British protectorate was established and the Khedive of Egypt carried on under the dictation of the British Agent-General.

In 1885 the Mahdist uprising in the Sudan cost General Gordon his life and made the fame of Lord Kitchener, who followed Sir Eldon Gorst as Agent-General of Egypt. Gromer, Gorst, and Kitchener succeeded in temporarily breaking the power of the Nationalist Party. In the World War the Egyptians were loyal to England, but they suffered so severely from the conscription of the young men and the commandeering of camels, donkeys, and crops that they were changed from allies to antagonists.

In 1919, led by the Nationalist leader, Zaglul, the Egyptians revolted against England, but General Allenby crushed the revolt and the Treaty of Versailles confirmed the English Protectorate—the Nationalists were not permitted to present their case before the International Tribunal in Paris. Then ensued three years of more or less passive resistence to English rule, punctuated by serious outbreaks; until England, in 1922, officially recognized Egypt proper as an independent state, but she still retains the Sudan and keeps the Citadel of Cairo heavily garrisoned with British troops.

Briefly outlined, this is the series of changes making up the history of Modern Egypt. But Mr. Young interprets all of these events through the personalities of the men who brought them about.

> The modern method of writing history, which is to ignore personalities and policies, to illustrate developments from the lives of the common people, and to explain it by economic factors and moral forces is inapplicable to Egypt. For except that cotton has replaced corn, the economics of Egypt are very much as they were in the days of Pharaoh and his foreign financial adviser Joseph. Its implements and industries are nearly all the same—the plough, the hoe, the shadouf. Until a very few years ago the Egyptian peasantry—nine-tenths of the people—lived much the same lives as they did under the Pharaohs. . . . The story of Modern Egypt must therefore be told in the old manner, mainly through the careers of its rulers and the political events of the day. . . . The general course of developments in Egypt would not have been so very different in its broad lines if the British Empire had never existed. . . . For Egypt is only a sector of the long front between the European and Eastern political systems; and the rise of the Egyptian nation takes its proper place geographically and historically in the long political process by which the European system of racial and regional national States has, race by race and region by region, encroached on the Eastern system of the religious Super-State.

In the last two chapters Mr. Young deals with the Sudan question and outlines a series of policies he believes would be wise for England to follow in unraveling this serious problem. The Sudan question is a very live one—the Egyptian Nationalists suspect England of Imperialistic schemes in the plans for the storage system of the White Nile and the draining of vast areas of swamp land; and the Nationalists feel that Egypt has a claim to the Sudan that is legal. It is possible that if England were to remove her troops from Cairo, to end her interference in Egyptian affairs through the Financial and Judicial Adviserships, and change the High-Commissionership back into a Consulate-General, that the Egyptian government might put more trust in her good faith.—E. L. B.